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THE JOURNAL

OF

THE ALLIED DENTAL SOCIETIES

VOLUME VIII—1913

PUBLISHED QUARTERLY BY THE ALLIED DENTAL SOCIETIES

THE FIRST DISTRICT DENTAL SOCIETY OF THE
STATE OF NEW YORK

THE AMERICAN ACADEMY OF DENTAL SCIENCE

THE HARVARD ODONTOLOGICAL SOCIETY

THE METROPOLITAN DISTRICT OF THE
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Contents of Volume VIII.

Buffalo (The) Convention on School Hygiene.....	279
BY THADDEUS P. HYATT, New York City.	
Concerning Dental Legislation.....	36
BY DR. WILLIAM P. COOKE, Boston, Mass.	
Dental (The) Nurse.....	1
BY C. EDSON ABBOTT, D.D.S., Franklin, Mass.	
Dental Nurse Problem (The).....	341
BY WILLIAM P. COOKE, D.M.D., Boston, Mass.	
Early History of New York State and District Dental Societies	28
BY WILLIAM CARR, M.D., D.D.S., New York City.	
Farrar, John Nutting, His Life and Work.....	198
BY JAMES TRUMAN, D.D.S., L.L.D., Philadelphia, Pa.	
Further (A) Study of Dental Caries.....	283
BY ALFRED P. LOTHROP and WILLIAM J. GIES, New York City.	
Journal Conference.....	3
REPORT BY S. E. DAVENPORT, JR., D.M.D., New York City.	
Knowledge and Belief.....	226
BY H. P. PICKERILL, M.D., University of Otago, N. Z.	
Massachusetts Dental Hygiene Council. Outline for Lecture	154
Meeting of the Dental Society of the State of New York..	93
BY DR. HERBERT L. WHEELER, New York City.	
Method (A) of Retention.....	118
BY DR. STEELE F. GILMORE, Indianapolis, Ind.	
N. D. A. (The) Meeting at Kansas City.....	195
BY DR. HERBERT L. WHEELER, New York City.	
Oral Infection by Vincent's Bacteria and Its Importance to the Dental Practitioner.....	11
BY HAROLD S. VAUGHAN, M.D., D.D.S., New York City.	
Oral and Other Aspects of Syphilis.....	19
BY C. MORTON SMITH, Boston.	
Practical Methods of Teaching Crown and Bridge Work— as Adopted by the Harvard Dental School.....	357
BY JULIUS F. HOVESTADT, D.M.D., Boston, Mass.	
Practical (The) Aspect of the Oral Hygiene Movement..	329
BY SIDNEY J. RAUH, D.D.S., Cincinnati, Ohio.	
Preventive Dentistry.....	123
BY HENRY A. KELLEY, D.M.D., Portland, Maine.	

President's Address, Massachusetts Dental Society.....	136
BY MICHAEL W. FLYNN, D.D.S., Springfield, Mass.	
Professional Journalism.....	140
BY WILLIAM B. DUNNING, D.D.S., New York City.	
Relation of Rigg's Disease and Removable Bridge Work..	345
BY DR. HOWARD T. STEWART, New York City.	
Report of Dispensary Committee, 1912-1913, Massachusetts Dental Society.....	230
Some Essential Facts Pertaining to the Construction of Anatomical Dentures.....	210
BY JAMES HARRISON PROTHERO, D.D.S., Chicago, Ill.	
Some Facts—Chemical and Otherwise—About Dentifrices	144
BY PROF. HOWARD C. KELLY, of the Central High School, Springfield, Mass.	
Some Observations on Mouth Conditions and Retention as Related to Pyorrhea Alveolaris from the Standpoint of the General Practitioner of Dentistry.....	96
BY CLARENCE J. GRIEVES, D.D.S., Baltimore, Md.	
Trifacial Neuralgia: Symptomatology and Clinical Treatment	5
BY NELSON T. SHIELDS, D.D.S., New York City.	

REPORTS OF SOCIETY MEETINGS.

First District Dental Society, S. N. Y., December 2, 1912..	46
" " " " " January 6, 1913...	237
" " " " " February 3, 1913...	158
" " " " " March 3, 1913.....	161
" " " " " October 6, 1913....	363
" " " " " November 3, 1913..	378
Boston and Tufts Dental Alumni Ass'n, December 11, 1912.	59
" " " " " February 12, 1913.	60
" " " " " April 16, 1913...	173
" " " " " Apr. 16, June 18, 1913.	250
" " " " " October 8, 1913..	398

EDITORIAL DEPARTMENT.

At Last—A National Association.....	252
Code of Honor (A).....	400
Dental Nurse Question (The).....	62
Dental Appointments by the Department of Health.....	64
Fourth International Congress on School Hygiene.....	174
N. D. A. (The) Meeting at Kansas City.....	176

New (A) College Building.....	177
Pendulum (The) in the Taggart Case.....	253
Reversal of the Taggart Decision.....	66
Relief (The) Fund of the National Dental Association....	403

NOTES ON PRACTICE.

Compiled by WILLIAM D. TRACY, D.D.S., New York City.

Gold and Tin Foils—Uses of Cocain-Adrenalin—Precautions in Analgesia Technique—Hemorrhage Following Extraction—Mellotte's Metal Dies—Influence of the Tongue on Respiration—After Treatment of Abscessed Teeth—Cleansing Root Canal Broaches—Root Canal Filling—Maxillary Osteomyelitis—Hints for Avoidance of Sepsis of Dental Origin.....	67-71
Significance of Pus in the Maxillary Sinus—The Use of Cement with Amalgam—Professional Advice—The Specialist—Treatment of Teeth Having Pyorrhea—Radiographs in Canal Work—Drying Root Canals—Etching Gold Inlays to Obtain Better Cement Adhesion—Wax Inlays—Sterilization of the Right Angle Hand-piece	179-181
Tubercular Infection from Dental Abscess—Sprue Former Too Large—Mixture of Amalgam with Cement—Preparing the Wax Core—On Baking Porcelain—Roentgen Diagnosis—Removing Posts—Partial Root Excision—Retarded Dentition—Drilling Amalgam Fillings—Removing Silver Nitrate Stains—Importance of Tooth Brushing—Prompt Treatment of Alveolar Abscess—Importance of Complete Pulp Removal—Hemorrhage Following Pulp Removal—Condensation of Amalgam.....	258-263
Condensation of Amalgam—Making Gutta Percha Points More Rigid—Cleaning Glass—Advantages of Platinum Collars in Crowns—Lanolin for the Hands—Warnings in Regard to Bridge Abutments—To Prevent Porosity in Thick, Heavy Lower Vulcanite Dentures—Bridge Attachments with the Aid of Accurately Cast Gold Inlays and Gold Mesh—Welded Gold Bands in Crown and Bridge Work—Requirements of a Crown.....	405-409

BOOK REVIEWS:

By C. FRANKLIN MACDONALD, D.M.D.

A Text Book of Dental Pathology and Therapeutics.
Based upon the original of the late Henry H. Burchard,
M.D., D.D.S.

REWRITTEN BY OTTO E. INGLIS, D.D.S.

Chemistry for Dental Students, Being Lecture Notes on
Chemistry for Dental Students.

By H. CARLTON SMITH, Ph.G.

An Introduction to Dental Anatomy and Physiology, Des-
criptive and Applied.

By ARTHUR HOPEWELL-SMITH, L.R.C.P., London; M.R.
C. S., England; L.D.S., England.....

Oral Surgery. A Text Book on General Surgery and
Medicine as Applied to Dentistry.

By STEWART LEROY MCCURDY, M.D.

72-78

Contents of Volume VIII

The Practice of Dentistry.
 BY LEO GREENBAUM, M.D., D.D.S., and MAX GREEN-
 BAUM, D.D.S.

Dental Laws Condensed.
 BY ALPHONSO IRWIN, D.D.S..... 182-186

Interstitial Gingivitis and Pyorrhea Alveolaris.
 BY EUGENE S. TALBOT, M.S., D.D.S., M.D., L.L.D..... 273-275

Anatomy, Descriptive and Applied
 BY HENRY GRAY, F.R.S. American and English edi-
 tions.

Exodontia.
 BY GEORGE B. WINTER, D.D.S..... 419-422

CURRENT NEWS	79, 187, 267, 413
CURRENT DENTAL LITERATURE.....	410
LEGAL NEWS	271
CORRESPONDENCE	190, 264

OBITUARY.

Chew, Edwin.....	87
Clements, Thomas W.....	423
Kingsley, Norman William.....	275
Litch, Wilbur F.....	191
Smith, Henry A.....	422

NOTICES.

American Society of Orthodontists.....	193
Massachusetts Dental Society.....	89
“ “ “	193
Minneapolis District Dental Society.....	426
New Jersey State Dental Society.....	192
“ “ “ “ “	277
Panama-Pacific Dental Congress (The).....	88
“ “ “ “ “	426
Sixth International Dental Congress, London, 1914.....	425
Virginia State Dental Association.....	192

INDEX.

Index to Volume VIII..... 427

THE JOURNAL

OF THE

ALLIED DENTAL SOCIETIES

VOL. VIII

MARCH, 1913

No. 1

THE DENTAL NURSE

This subject is now attracting much attention from progressive dentists who are actively interested in the question of the distribution of dental services. Dentists, like other public servants, are now engaged in trying to extend the benefit of their special service to the mass of mankind. The demonstration of the vast influence for weal or for woe, of the healthy and efficient, as contrasted with the diseased and faulty mouth mechanism has, first, caused dentists to realize the dignity of their calling. It has raised them in public estimation and increased the field and reward of the average dentist. Secondly, the progressive, public-spirited dentists have sought to educate the general public to appreciate and pay for their services. Thirdly, these men are extending to the needy public, particularly the children, free instruction on how to care for their mouths. Free clinics to relieve pain and repair defects are being operated. The Forsyth brothers deserve all thanks for their philanthropy.

Dental scientists, like others, are now devoting their attention to prevention. To largely prevent tooth decay by instruction and systematic prophylactic operations is possible. At present we dentists are filling, bridging and regulating the teeth of a few of the well-to-do. The great mass of mankind knows the dentist

only as an extractor. Our numbers are too few and the ability of the masses to pay too little to hope for universal dentistry along the old lines.

In Massachusetts, the dentists who have been most active in the past in favoring and promoting the progress of dental art have almost to a man come to favor the dental nurse as the next step. They have maintained free dental dispensaries. They advanced the Oral Hygiene movement. They appreciated and supported professional journalism. They supported research and post-graduate studies. The Union Meeting of Dental Societies of Massachusetts this winter showed the mass of advanced dentists heartily in favor of the dental nurse. Dr. Fones, that master of prophylaxis, and Dr. Ottolengui, that versatile and gifted editor, demonstrated beyond dispute the practicability of and need for the dental nurse.

Do the opponents show some other plan for preventing the frightful ravages of dental caries? Do they deny that these nurses will be of benefit to the public whom we claim to serve, whether in dental dispensaries or in educating the children as school dental nurses, or in doing the office oral prophylaxis which almost no dentist now finds time to do? The dental nurse will help in one's practice and dignify one's calling by doubling his efficiency and leaving him free to do the more exacting operations.

If the opponents of the dental nurse bill oppose this idea *in toto*, let them come forward with some constructive plan to do for the poor children what this measure, offered by our leading dental philanthropists, proposes to do. If opposed in part, let them in good faith offer perfecting amendments.

The dental profession of Massachusetts is alert and unselfish at heart. It has not in the past and it will not in the future, tolerate opposition to advance, based simply upon conservatism or personal antagonism.

C. EDSON ABBOTT.

JOURNAL CONFERENCE

On Saturday, February 15th, the annual meeting of the Publication Committees and representatives of the Allied Dental Societies took place in New York City. After luncheon at the City Club the business conference was attended by ten Massachusetts men and twenty-one members of the First District Society of the State of New York. At 3.30 P. M., Dr. S. E. Davenport called the meeting to order and addressed a few words of welcome and explanation to those present. After the election of Dr. S. E. Davenport, Jr., as secretary, Dr. C. Edson Abbott, chairman of the Committee on Publication, was introduced and took the chair. The treasurer's report was read and accepted and Dr. Davenport read a few letters from men who had been unable to be present, complimenting the societies on the marked improvement of *THE JOURNAL* during the past year and declaring their allegiance to the cause of Professional Journalism.

Editor-in-Chief Dr. Wm. B. Dunning next gave a resumé of the problems that at the present time confront *THE JOURNAL* and suggested many improvements; among other things that the word "Dental" be added to the title of *THE JOURNAL*. Short speeches were made by the following, in the order named: Drs. Davenport, Jr., W. D. Tracy, MacDonald, Abbott, Rice, Kemple, Jameson, Warner, Richburg, Hyatt, Proctor, Gillett, Howe, Pike, Locherty, Ferris, Daly, Piper, Kimball, Adams, Arnold and Linton. These gentlemen made many valuable suggestions and it was their united opinion that *THE JOURNAL* had improved wonderfully in the past year and that there was every reason to believe it would continue to do so. It was the sense of the meeting that more subscriptions from ethical dentists, not members of the Allied Societies, should be secured, and also that more advertisements from high class firms would be very acceptable (following the rule, of course, that all formulas be made known to the Publication Committee). It was found that some steps had already been taken along these lines and all present promised their loyal personal assistance.

Dr. Richburg suggested a specified change in the title page

of THE JOURNAL and moved its adoption. Motion seconded by Dr. Davenport. Amendment by Dr. Proctor that a committee consisting of Drs. Abbott, Dunning and Davenport, Jr., decide the matter. Amendment carried. The election of officers resulted as follows:

Dr. Wm. B. Dunning, Editor-in-Chief.

Dr. S. E. Davenport, Jr., Associate Editor.

Dr. Karl C. Smith, Treasurer.

Board of Publication

Dr. C. Edson Abbott, Chairman.

Dr. S. E. Davenport.

Dr. William Rice.

Dr. Charles T. Warner.

Dr. Charles A. Jameson.

Dr. Alfred G. Richburg.

In the evening there was an informal banquet at the Republican Club. Dr. H. L. Wheeler presided in a most able manner and made one of the best speeches of his career in favor of concerted action in continuing the improvement of THE JOURNAL, and in pushing the cause of Independent Journalism. A few other gentlemen were called upon for short speeches and they responded with many additional suggestions.

It was felt that this second annual conference of a few of the prominent supporters of Independent Journalism would be of considerable value in furthering the cause. Praise for the best of the dental journals now published by supply houses was given on every side and it was the consensus of opinion that these journals have their rightful place in the progress of dentistry to-day. Every man present, however, felt proud of the part he was playing in the advancement of a dental journal that is free from the usual commercial influence and that is published by dentists for dentists for the ethical uplift of the dental profession all over the world.

S. E. DAVENPORT, JR.,

Secretary.

TRIFACIAL NEURALGIA: SYMPTOMATOLOGY AND CLINICAL TREATMENT¹

BY NELSON T. SHIELDS, D.D.S., NEW YORK CITY

I will call your attention to some of the salient features of trifacial neuralgia or tic douloureux, dwelling especially upon the clinical history and upon the indications for and the methods of treatment; prefacing my remarks with a brief reference to the etiology and pathology of the affection.

Etiology—It must be acknowledged that in every case the fundamental cause lies in some structural change, either central—that is, in the Gasserian ganglion; or peripheral, in one of its divisions. In a large percentage of cases we are able to single out certain conditions between which and the lesion itself the relation of cause and effect is easily proven. Very often patients have severe pain about the ear, and upon examination of the teeth large amalgam and gold fillings are found in molars where the canals are small, and a lesion is easily formed from irritation, causing the odontoblasts to calcify in the small canals. Thus, for example, there are sources of peripheral irritation, in many cases infectious, such as herpes, or some lesion within the teeth, regardless of whether the tooth or teeth are in perfect condition externally, which give rise primarily to a peripheral neuritis, and secondarily to neuralgia. On the other hand, there are certain systemic conditions which, by virtue of the fact that they are sometimes the forerunner of this disease, have been regarded as predisposing causes. In this class we may include exhaustion, hemorrhage, overwork and strain; some forms of neurosis, as migraine, diabetes, chronic nephritis, gout, rheumatism and lead poisoning. Women are more generally attacked than men, and the great majority of cases after the period of middle life. We must remember that the teeth erupt through the gums fully developed externally excepting at the apical portion of the roots, and that a structural change continues to take

¹ Read before the First District Dental Society, S. N. Y., December 2, 1912. See disc., p. 46.

place from the erupting period to the end of our lives, excepting in people who have all their teeth extracted. Teeth become more and more dense, as we grow older, from without inward. It must also be remembered that some teeth never erupt, and frequently when these become infected, acute and chronic structural changes arise therefrom. In all cases of illness, overwork, absence of proper nourishment, the non-assimilation of food, or a continued strain in any way whatsoever, wherein the rest at night cannot restore the tissue consumed in our daily vocations, it matters not what our vocations may be, serious structural changes within the teeth, alveolar process and gums will be caused.

Pathology—My clinical experience of innumerable cases teaches me that there is but one distinct type of tic douloureux, unless the case has been seriously neglected, or operated upon without the definite knowledge that the lesion is primarily a neuritis of the peripheral branches within the teeth which will not extend to and invade the Gasserian ganglion when prevented with dental treatment to be hereinafter described. Without this knowledge, lesions may extend to the ganglion and a central operation made necessary, in which case we have a second form of trifacial neuralgia. Consequently, I have always checked the disease in the peripheral branches within the teeth of the superior and inferior maxillary branches—which I class as one, on account of the intimate relation. A lesion in an upper tooth will reflex the pain to the lower teeth and vice versa. In my opinion, ninety-five per cent. of the cases have their origin in the peripheral branches within the teeth. I presume I will have to admit the possibility of a lesion in the central nervous system, making a third form of trifacial neuralgia.

Symptomatology—It would not be amiss here to remind you of a few facts concerning the anatomy and physiology of the fifth cranial nerve. It arises by two roots, a motor and sensory, the latter very much larger, at the apex of the petrous portion of the temporal bone; the fibres of the sensory root form a semilunar ganglion, the Gasserian ganglion; from the anterior border of this structure are given off three branches—the ophthalmic, the superior maxillary and inferior maxillary; the first two di-

visions are pure sensory roots, but the third receives fibres also from the motor root. The motor root supplies the muscles of mastication, and the sensory root the skin of the face, the mucous membrane of the mouth and nasal cavity, the conjunctiva and cornea, and anterior part of the tongue with gustatory fibres. When the first division is involved, the tender points will be found at the supraorbital notch, in the outer part of the upper eyelid, and at the emergence of the nasal branch at the lower edge of the nasal bone. The second division gives off a few branches as it traverses the sphenomaxillary fossa and appears at the infraorbital foramen as the infraorbital nerve, where it divides into the palpebral, nasal, and labial branches. When this division is involved, the tender points will be found at the infraorbital foramen, at the side of the nose, and over the most prominent portions of the malar bone; pain will be referred also to the teeth and gums of the upper jaw. Finally, if the third division is involved, pain will be referred to the distribution of one or all of its sensory branches; to the parietal eminence, temple and external ear (temporal and auricular-temporal branch), to the tongue (lingual branch), to the gum and teeth of the lower jaw (inferior dental branch), and to the lower lip (mental branch). The auriculo temporal crosses the zygoma, over the parietal eminence, in the tongue and at the mental foramen. The pain in these respective distributions is so severe that self-destruction is sometimes resorted to. The reason for the severe pain is very plain. The smallest blood vessels within the body are located within the teeth, and in all cases of trifacial neuralgia there will be found pulp stones or calcified masses throughout the diameter of the pulp, and in many cases the whole pulp is nearly calcified, leaving the slightest space for the circulation of the blood; the tendency to strangle the pulp is the direct cause for the almost unbearable pain in a large majority of cases. When impacted teeth become infected the cause for lesion is very acute, giving rise to great pain, suppuration and fever, but when they do not become infected but cause a lesion either with one of the main trunks or peripheral branches, this is another direct cause for tic douloureux.

Classification—We have alluded to three classifications: First, a classification based on the seat of the lesion, peripheral, and, if neglected, perhaps ganglionic. Second, a classification based upon the distribution of pain, whether in the distribution of the first, the second, or the third divisions alone, or in two or all three of these divisions. Third, a classification as suggested by Dana, which recognizes two types—one the migrainous type occurring almost always in the early life of women suffering from migraine. After a number of years it becomes chronic and more localized, settling in the second or third or all three divisions.

Treatment—First of all, what resources have we upon which to draw? They may be summed up under three headings: The medical or non-operative, dental and operative to the extent of carefully diagnosing the teeth within which the lesions are suspected, and thirdly, opening into the pulps of the teeth suspected and the extirpation of the pulps with cocaine using pressure anesthesia. After the thorough removal of the pulps mechanically, thorough asepsis being maintained throughout, the canals should be filled at their apices with gold and the remainder of the canal with oxychloride of zinc. The smallest blood vessels being removed from the affected teeth where the peripheral lesions have occurred, the pain will discontinue until a lesion at another peripheral, within another tooth, has been indicated. In severe cases I do not hesitate to remove all the pulps on both jaws through the same method of procedure, which in my hands has never failed to cure and without return. I strongly urge the daily use of Parke Davis's fluid extract of cascara sagrada as a tonic and laxative, which acts on the liver with regularity, inducing its normal secretion of bile which restores health. Through the means of radiography, if there are any impacted teeth causing a lesion, the dentist will find them, and with the aid of a dental surgeon, restore that portion of the jaw to health. Poor circulation is generally present, and the relief that follows the extirpation of the smallest place through which the blood has to circulate is something phenomenal.

A Mr. G——, from Montreal, July, 1909, telephoned me from Canada at the last moment about himself. He was about to

have twenty-nine teeth extracted through the advice of his physician. I advised him not to have them extracted then, but to come to New York first, then if found necessary to extract, return to Montreal, and have it done. He was suffering terribly. The roots of all teeth exposed and pain all over the three branches. I advised him to have every tooth saved excepting one. I first extirpated the pulp from his superior left cuspid with cocaine, as described, and from that minute I had his neuralgia under control. I extirpated every pulp from the teeth in both jaws and treated and filled as above described, and restored his teeth to normal usefulness (with two full bridges, which, however, is not a part of this paper), and not one pain save a little congestion in the gums occasionally near the cervical margin has he had since. He has not required more than a few minutes' treatment since completion.

I wish to place a Mrs. F——, from Connecticut, on record; age sixty, recommended by her physician to go to the Mayo Brothers for relief, although only eight months' relief was promised. She was recommended to me before going to Mayo's, August, 1912, and I found an extreme case of *tic douloureux*, of one year's standing. Her physician had exhausted all medical means of relief. Her neuralgia was on the entire left side of the face and her condition pitiful. Her gums and remaining teeth and alveolar process in perfect condition, but her circulation very poor. The canals of both superior laterals and inferior centrals were practically calcified at the central portion of the roots; extirpation very difficult; teeth externally perfect. No person of sixteen years old had gums and alveolar process in better condition. I extirpated the pulp from her superior left cuspid with cocaine as above described, and arrested the pain. I have all pulps on left side extirpated excepting two, and as all teeth are sensitive to heat and cold, I will extirpate the pulps from them all and treat as above described. This lady could neither eat nor scarcely drink, nor open the mouth, without great danger of creating a spasm. She can now do all of these without fear, and I expect nothing but the usual result—success and comfort without return of trouble.

I will pass around a radiograph taken of a patient, a Mr.

C——, of New York, which will show you the silver screws screwed in the inferior orbital foramen and mental foramen after the nerves from these respective places had been resected. Pain returned after about two years and an injection of alcohol was made into the superior maxillary and inferior maxillary branches, just as they emerge from the base of the skull, which relieved the pain for one year. The second injection only relieved for a period of two months. The third injection on November 20, 1912, and the pain at this time is quiet. You will observe from the radiograph a light shadow about the position of the posterior portion of the maxillary sinus resembling practically the anatomy of a wisdom tooth. Had this patient had the original lesions removed from his teeth, there would have been no necessity for the surgical treatment, as you can plainly see. This patient is about sixty-five years old.

From a dental standpoint, we find the lesion and apply the remedy; from a surgical standpoint, branches of the nerves are resected and the foramen plugged either with a silver screw or silver foil, or else a branch cut and rubber placed between the excised branch and main trunk to prevent reunion, or injection of alcohol in the superior and inferior maxillary branches can be resorted to. Resecting or excising a branch only temporarily relieves, because the lesions in all the peripheral branches are left untouched, and when the least nerve fibre connects this branch with the main trunk, the pain returns and the interval of relief grows shorter and shorter between each operation or alcohol injection, and the patient begs for more radical treatment.

Firstly, then, when the physician cannot cure, a dentist skilled in this work can do so in ninety-five per cent. of his cases, as I have approximated. The last resort should be the surgeon and the avulsion of the sensory root, which is a terrible alternative, but better than death.

I am greatly indebted to Dr. Harvey Cushing and Dr. Charles H. Frazier for their research in the relief of trifacial neuralgia.



Description on Page 10.

ORAL INFECTION BY VINCENT'S BACTERIA AND ITS IMPORTANCE TO THE DENTAL PRACTITIONER¹

BY HAROLD S. VAUGHAN, M.D., D.D.S., NEW YORK CITY

Ulcerations of the fauces and tonsils with occasional extension to the oral cavity have been reported in medical literature for the past twelve years or more. This infection has been known as Vincent's angina, ulcero-membranous angina, chancriform-angina, diphtheroid-angina.

A few references have been made to this condition in the oral cavity alone, but in searching dental literature I have been unable to find very much that is descriptive on the subject, although I am convinced that it is occasionally met with and not recognized by the dentist, being often spoken of as acute receding gums, acute pyorrhea-alveolaris, or ulcerated gums.

This infection is of the greatest importance to the dental practitioner, as many cases of pyorrhea-alveolaris owe their inception to the destruction of the interproximate gingival tissue produced by this ulcerative process which, when allowed to extend, soon destroys the supporting structures of the teeth; or, again, a Vincent's infection following upon a pyorrhea, produces rapid destruction of the remaining tooth support.

During the past four and a half years, nineteen cases have been seen in private practice; some of these have been severe, involving all the interproximate gingival tissues and adjacent structures; others have been mild, affecting the interproximate tissues in two or three places only.

Vincent's angina is of especial importance from its close resemblance to diphtheria, and also from the fact that certain of the mouth ulcerations may be mistaken for syphilis.

According to H. C. Plaut, the bacillus and spirillum found in this disease were first described by W. D. Miller in 1883, during his early studies on micro-organisms of the mouth, and were considered by him as saprophytes.

¹ Read before the First District Dental Society, S. N. Y., December 2, 1912. See disc., p. 56.

Babes found these bacteria in the exudate from the gums in a case of scurvy.

H. C. Plaut, in 1894, described cases of fetid-membranous stomatitis and tonsilitis in which a spirillum and fusiform bacillus, called by him Miller's bacillus, were found in the exudate.

In 1896 H. Vincent found and described similar organisms in cases of hospital gangrene seen in Africa.

These early reports received little attention, but in 1896 H. Vincent again reported these same germs in severe cases of tonsil-ulceration. This latter report attracted general attention, and since that time considerable literature has appeared on the subject—Vincent's name being coupled with the germ combination of a fusiform bacillus and spirillum. During the past twelve years many papers have appeared in this country on this subject. Sobel and Hermann, in 1901, reported twelve cases of sore throat in children; in one of these cases the ulceration involved the tongue and cheeks alone; smears of the exudate showed Vincent's bacteria as the active organisms.

W. N. Berkeley, in 1905, in a paper before the New York Academy of Medicine, Section on Medicine, called attention to the importance of this disease; he refers to the fact that instead of the tonsils, the lips, cheeks, gums, or the tongue, or all combined, may show a pseudo-membrane or active ulcers in which these bacteria are present in great numbers.

W. J. Lederer, in 1909, reported four cases of buccal Vincent's angina seen at the German Hospital, New York.

Colyer and others have shown the presence of these bacteria in cases of gangrenous stomatitis.

The majority of reported cases have been infections of the tonsils and fauces. We note that the activity of these organisms has not been confined to this region alone.

H. Arrowsmith reports a case of primary laryngeal infection; Held, one of the middle ear and mastoid with fatal termination; Yates, one of mastoid infection.

In looking over the reports, I have been unable to find any literature fully descriptive of the pathology and clinical features of this infection, as I have observed it in the oral cavity—the

ragged appearance of the gingival margins, the deep holes from destruction of the interproximate tissues, the grayish deposit, etc.

Some of the older inactive cases present the appearance of the phagedenic pericementitis of Black.

Pathology—The organisms grow in masses producing a penetrating ulceration of variable size; the very recent cases showing only a slight destruction of the tip of the interproximate gum festoon, which is very tender to pressure with the tongue or by the action of the toothbrush, the interspace being filled with a grayish deposit made up of destroyed tissue cells and masses of the specific bacteria. When this is scraped off, a raw sensitive surface remains; moderate pressure against such a spot produces free bleeding, and the ulceration may progress to complete destruction of the interproximate gum tissue, pericementum and alveolus, forming deep pockets that are very difficult to cleanse.

As the alveolus disappears, the tooth is left without support and becomes loose, thus favoring deeper infection. Another favorite location is at the gingival margin on the buccal side of the upper second and third molars where the overlying cheek interferes with proper cleansing.

The ulceration consists of a grayish necrotic covering which, when rubbed off, leaves a highly sensitive bleeding surface beneath. The reproduction of this membrane or deposit is very rapid, accumulating again in an hour or two; smears from these deep ulcerations in acute cases show pus cells, necrotic fragments, mucus and nearly pure growth of Vincent's bacteria. The surrounding gum is deeply congested, the submaxillary and cervical lymph-nodes are enlarged and extremely tender in some cases.

Another favorite location for the ulcers is at the gingivo-buccal angle, especially in the third molar region. Here they are more troublesome, causing pain on movement of the cheeks. These severe cases are the ones that have been allowed to extend from the mild infections which, with a proper recognition and prompt treatment, could be checked at the outset.

The age in the speaker's cases varied between nineteen and fifty; sex—fourteen males and five females. The symptoms vary with the severity of the case, from slight ulcerations sensitive to

the touch, to extreme involvement with severe constitutional symptoms; temperature 102 degrees, dysphagia, headache, malaise, nausea, marked salivation, loss of appetite, glandular enlargement. The ulcerated areas are extremely painful, especially when subjected to irritation by pressure from the tongue, movements of the lips and cheeks and from particles of food in eating; there is local heat and pain out of proportion to the size of the lesion, increased cardiac and respiratory action, gums tender and bleeding easily.

A characteristic feature in severe cases is salivation, especially at night, the pillow being stained with blood-streaked saliva. The breath is offensive, of sweet sickening odor, and of distinct diagnostic importance to one who has noted it in other cases.

The mucous membrane of the mouth and tongue is deeply congested.

Communicability—These cases are mildly infectious. In my cases, in one instance, the husband, and then later the wife became infected. Berkeley, Sobel, Lederer, and others have reported two or more cases in one family.

Duration—Mild cases will recover in from one to three weeks, while those of long standing will last for a much longer period, though the ulcerative process may be under control.

Several of my cases were seen early, before extreme ulceration, and were easily controlled; therefore, too great emphasis cannot be placed upon the importance of early recognition of the ulceration, before the gingiva and alveolar septum has been destroyed, as they can then be quickly cleared up before permanent damage to the supporting structures of the teeth has occurred; whereas deep inaccessible pockets may serve as centres for reinfection and offer much greater resistance.

Diagnosis—The diagnosis is made by the ragged appearance of the gum margins which are covered with a grayish necrotic deposit, which also fills up the dental interspaces, and when removed leaves a bleeding surface beneath. There may be partial or complete loss of the gum festoon; the odor of the breath is very characteristic; the patient complains of soreness of the mouth; glandular enlargement, often painful deglutition in severe cases (often mistaken for syphilis and diphtheria).

Microscopical Examination—With a sterile instrument or platinum loop some of the deposit or pseudo-membrane is taken from the ulcer and spread thinly over a glass slide. It can then be fixed by passing through a Bunsen flame and stained with carbolfuchsin, Loeffler's methylene blue or Giemsa's stain, when it is ready for examination.

The practical way is to make three or four smears on clean slides, and send them to a competent pathologist.

Bacteriology—Reference is frequently made to bacteria of similar appearance, occurring as saprophytes in old pyorrhea pockets without causal relation. In these cases the organisms may have become attenuated and lost their virulence, though following a severe Vincent's infection a fertile soil remains for the development of pyorrhea-alveolaris.

It is also understood that a mouth affected by pyorrhea with the presence of areas that are not readily cleansed favors the development of this and other infections.

The organisms occurring clinically as Vincent's bacteria are two in number:

I. A spindle-shaped bacillus which Vincent named the bacillus fusiformus. Its length is 7 to 14 microns and 1 to 2 in thickness, staining with Ziehl's carbolfuchsin or Giemsa's stain; often having a beaded appearance; unstained zones with stained areas between.

II. A spirillum about one-half as thick as the bacillus, staining much more lightly. Its axial length is 15 to 25 microns. Earlier observers had found it impossible to cultivate these organisms on artificial media; later, Tunncliffe produced cultures successfully under anærobic conditions upon slants of ascitia agar at 37.50 degrees C. He found that before the fifth day only the bacilli could be found, but after this time spirilla gradually appeared, and constituted the majority of the organisms in the culture. It appeared to Tunncliffe from this study that the spirilla might be developed out of the fusiform organisms representing the adult form.

Treatment—The treatment varies with the severity of the case—the first essential is thorough cleansing of the teeth and mouth, light diet, the bowels being freely opened; cold compresses

or an ice bag for the glandular enlargements. As a local application to the ulcerating areas every two or three days, the following agents are of values: Silver nitrate, 15 to 30 grains to the ounce of water; Lugol's iodine solution; chromic acid, ten per cent.; zinc chloride, two per cent.; argyrol, full strength. The teeth must be kept clean, using sprays, or the patient can use a bulb water syringe to flush out each interproximate space. Mouth washes should be used frequently. Lederer advises 1-10,000 bi-chloride of mercury in a four per cent. solution of boric acid; Berkeley suggests bicarbonate of soda and boric acid in warm water. I have used liquor formaldehydi in the following prescription:

R	Menthol	gr ii
	Thymol	gr ii
	Liquor formaldehydi	m xxx
	Spts. vin. rect.....	℥iii
	Aqua qs. ad.....	℥viii

Sig.—Teaspoonful in part of a glass of water several times daily.

Surgical Treatment—The writer in several cases has had good results from excising a V-shaped portion from the labial and lingual wall of an interproximate pocket, thus reducing its depth and favoring cleanliness. Dr. Clinton B. Parker, of Brooklyn, obtains good results by even more radical excision.

The following histories of several typical cases are given:

Case I—Mr. J—, age 35; first seen in November, 1908; family history negative. General health not very good since an attack of malaria some years ago. For past two months had complained of pain and soreness of the gums, which bled freely; increased salivation; in the morning his pillow would be stained with blood-streaked saliva. The submaxillary and cervical glands were enlarged and very painful; the tongue and buccal mucous-membrane very red; the breath offensive; ulceration of the gingival margin about all the teeth which had extended, forming deep pockets in many places. In addition, there was a large ulceration of the cheek adjoining the left lower third molar. Temperature 102 degrees; dysphagia, general malaise, loss of appetite; smears from the ulcerating areas examined by Dr. W. M. Higgins showed almost pure growth of Vincent's bacteria. Owing



FIG. 1.—Models from case II, showing active gingival ulceration.



FIG. 3.—Palatal aspect of FIG. 2.



FIG. 2.—Model from case I some weeks after ulceration had ceased, showing lack of interproximate tissue.



FIG. 4.—Case now under treatment, showing gingival destruction around left central, lateral and canine.

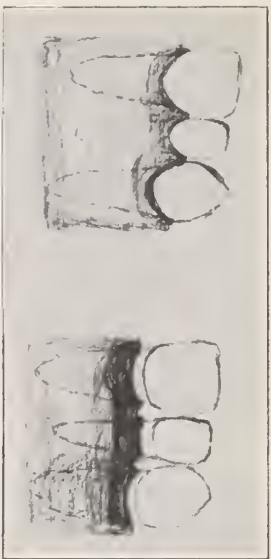


FIG. V.—Characteristic progress of ulceration. "A"—normal festoon; ulceration will take place along cervical margin and interproximate space become filled with deposit.

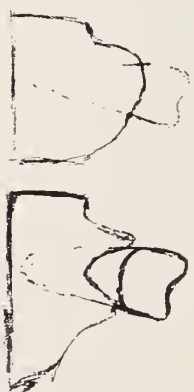


FIG. VI.—Manner in which the ulceration progresses interproximately.

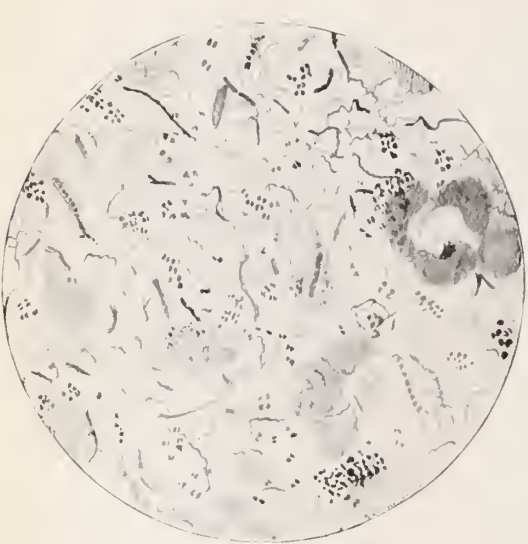


FIG. VII.—Vincent's bacteria, after W. J. Lederer.



FIG. VIII.—Deep pockets cleansed by V-shaped incisions lingually, thereby hastening cure.

to the deep ulcerations the case was extremely stubborn, and although the active ulceration was checked in a few days, it took three months to effect a cure. Eighteen months later a recurrence took place, although milder than the first.

Case II—Mr. L——, age 36; always enjoyed good health; history negative; for four months previous to the time the writer saw him he had been under treatment for inflamed gums, which were very sensitive and bled easily; bleeding and salivation at night so that the pillow would be stained; some glandular enlargement; temperature normal; breath very offensive; active ulceration of the gingivæ with destruction of the interproximate gum tissue and bony septa in many places; smears examined by Dr. Higgins showed Vincent's bacteria.

Case III—Mr. Mc——, history negative; for past two weeks complained of bleeding and sore gums; examination showed small ulcers in the interspaces of the lower teeth from the second bicuspid on the right side to the left canine; the interproximate spaces being filled with a grayish deposit, which on removal left a bleeding surface; smears showed abundant Vincent's bacteria. The teeth and mouth were thoroughly cleansed, and applications of argyrol made to the ulcerated areas. Improvement was immediate, although it required several weeks to entirely clear up the condition.

Case IV—Mrs. C——, age 27; always most careful about the care of the mouth. For the past three days complained of several sore places between the teeth; examination showed small ulcerations of the interproximate gingiva in several places; smears of deposit from the ulcers proved to be Vincent's bacteria.

The ulcers were cleansed and painted with Lugol's solution; repeated twice; the condition cleared up within a week.

I have reported more in detail four of the nineteen cases I have observed, I and II being severe types of longer duration, III being only of moderate severity, and IV being a very mild case.

The point to be emphasized is the importance of an early diagnosis followed by active treatment to prevent permanent damage to the supporting structures of the teeth.

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ORAL AND OTHER ASPECTS OF SYPHILIS¹

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Syphilis is a chronic, constitutional, contagious disease, always developing from a previous case, either by direct contact or through the intervention of some article acting as a carrier of the contagion. The disease may also pass from parent to offspring. Syphilis is due to a definite micro-organism, the *trepanema pallidum* or *spirochæta pallida*, discovered by Shaudinn and Hoffman in 1905. The acquired form invariably begins with the primary lesion—or chancre—which occurs at the point where the germs enter the body, and is accompanied by a pronounced enlargement of the nearest lymph glands. This constitutes the primary stage of the disease. For a time after infection, the spirochætes remain near the point of entrance, and later may invade nearly all the organs and tissues of the body. The terms primary, secondary and tertiary stages, while arbitrary, are of value in classifying the lesions of syphilis. As a disease, it runs a chronic course marked by remissions and relapses, this being its natural history and not due to faulty treatment.

The Chancre or primary lesion in those who care for the sick, occurs chiefly on the fingers about the nails. The primary lesions of the lips, tongue and tonsils are usually the result of infections from drinking glasses, eating utensils, pipes, kissing, etc., or any infected article passing quickly from the diseased to the healthy.

It is usually difficult to trace the source of infection in these extra-genital cases on account of the long period of incubation which elapses after inoculation before the appearance of the primary sore. There is also a pretty definite period following the appearance of the sore, before the outbreak of constitutional manifestations.

We know from clinical observation and experiments on animals that the time from inoculation to the appearance of the primary sore or chancre averages from twenty-one to twenty-eight

¹ Read before the American Academy of Dental Science, Boston, Nov. 6, 1912.

days—sometimes longer—seldom shorter. This is known as the primary stage of incubation. Generally within the next ten days the neighboring lymph glands show a painless, hard swelling. This early enlargement of the glands is so constant as to be of diagnostic value and is really part of the primary lesion. From the appearance of the primary sore to the development of eruptions upon the skin, commonly spoken of as “secondary manifestations,” from forty-two to forty-five days elapse. This is the second period of incubation. During this time the parasites are multiplying in and about the primary sore and are spreading through the economy by way of the circulatory system.

In the primary stage, the general health is slightly if at all impaired, but with the advent of the second stage there may be severe malaise, headache, fever, loss of weight and strength. It is not infrequent, at this period, for a case to be diagnosed as grippe, typhoid fever, pleurisy or some other disease, according to the prominent symptoms, its true nature being suspected only on the appearance of the skin eruptions. These errors in diagnosis are more likely to occur in cases of extra-genital infections where the possibility of syphilis is not considered. With the secondary manifestations, there is a general enlargement of the superficial lymph glands. The rash itself is often overlooked entirely by the patient or mistaken for prickly heat, measles, hives, etc. As a matter of fact, syphilis is a most excellent imitator, the manifestations both early and late, at times, simulating non-syphilitic eruptions to a wonderful degree. The early outbreaks vary greatly in appearance from the flat measles-like spots to large, hard, scaly papules and crusted pustules. There may be various combinations of eruptions present at the same time. There is usually no itching or other subjective symptoms with the rash, but an afternoon temperature of from 99° to 101° is not uncommon. The early eruption becomes much more prominent on exposure to cold. Soon after the eruption appears upon the skin there occurs a more or less severe outbreak on the mucous membrane of the lips, cheeks, tongue or throat. It is probably similar to that occurring on the skin, but moisture, warmth and irritation from eating and talking, soon change the spot into a mucous patch by the wearing away of the mucous membrane.

These spots are found in any part of the mouth and are aggravated by lack of care and irritation of broken and decayed teeth as well as by the use of tobacco and alcohol. While these lesions may occur in any part of the mucous membrane, there are certain favorite locations, e. g., at the corners of the mouth where there is a distinct mucous patch on the inside of the cheek, and often a fissured papule on the outside that looks as though an attempt had been made to enlarge the mouth with a sharp knife. Every movement of the lips in talking, eating, laughing, etc., opens this fissure, causing pain and bleeding. Other sites are along the edges of the tongue, the cheek near the wisdom teeth, the soft palate and running down over the face of the tonsils. In size these patches vary greatly and they may become confluent, covering large areas, extending well on to the hard palate. Their outline is irregular, the edges raised slightly and the surface looking as though touched with a weak solution of nitrate of silver. Where the spots have remained for some time, the centre may become eroded, giving a reddish color. They secrete a clear serum which contains vast numbers of spirochaetes. In fact it is easier to obtain the organism from these lesions than almost any other. These mucous patches are one of the greatest sources of contagion, and their speedy cure does much towards limiting the spread of the disease.

These patches occur in the mouth chiefly during the second stage of the disease, being more numerous and more infectious in the earlier months. The infectiousness diminishes in inverse ratio to the age of the disease. Lesions characteristic of all three stages occur in and about the mouth or throat, e. g., primary lesions, mucous patches, gummata and late ulcerations.

Primary lesions—In non-venereal infections, the lip is probably the most frequent site of inoculation. It may occur on either or both lips; is usually single—and when multiple, is so from the beginning. The chancre starts as a slight break in the mucous membrane and is considered to be an ordinary cold sore. The spot increases in size, becomes distinctly thickened and hard and is an “erosion on an indurated base.” There is little tendency to ulcerate and healing is slow. The lesion does not bleed easily even on rather rough handling, but secretes a clear serum

quite abundantly in which spirocheates can be easily demonstrated either by the dark stage or by staining. In size, the lesions vary greatly—in character, very little. Practically, the description of primary lesions of the lip, applies equally well to the tongue, tonsil or elsewhere. They are of comparatively rapid growth, occur at any age and the superficial lymph glands show an early enlargement. The primary lesion is to be differentiated from cancer, tuberculosis and the late lesion of syphilis—the gumma. In making an early diagnosis, the microscope and Wasserman reaction are of great help. The blood test becomes positive during the third or fourth week—sometimes earlier. Both cancer and tuberculosis develop much more slowly and without early glandular involvement, cancer occurring rarely before the age of forty or fifty.

Without treatment, mucous patches recur during the first few years, becoming less and less marked as time goes on. Lesions of the second stage, either upon the skin or mucous membrane, are general, superficial and heal without scars. Conditions in the mouth, liable to be mistaken for mucous patches, are the common canker spots, Vincent's angina, smokers' patches or leucoplacia, and possibly the geographic tongue. Sometimes diphtheria may complicate. Before the days of culture diagnosis, syphilis was not infrequently mistaken for diphtheria. Such errors now should be extremely rare if both the spirocheate and the diphtheria bacillus are sought.

To differentiate—canker spots are smaller, more nearly round, deeper, with a scooped out appearance showing a dirty, grayish base and sharper border, surrounded by a zone of redness. As a rule, canker spots are much more painful in proportion to their size and run an acute self-limited course.

Vincent's angina is comparatively rare; occurs generally on tonsils or soft palate, is acute in onset and more inclined to superficial ulceration. It runs a fairly rapid, self-limited course, healing usually without scar formation. Smears stained with methylene blue show the lance-shaped bacillus. There is, of course, no history of a primary lesion or skin manifestations.

Smokers' patches occur most frequently on the inside of cheek and dorsum of tongue. The mucous membrane has an

astrigent, half tanned appearance, and when well advanced, may show small ulcerations somewhere within the large white areas. There is the history of excessive smoking, and the teeth and general appearance of the mouth confirm it. Leucoplacia also rarely develops after chronic syphilitic patches, in which case the history and some evidence of the disease remains, such as scars or positive blood test.

Furthermore, the syphilitic lesions heal quite rapidly under treatment, leaving only the large, smooth, whitish areas.

The geographic tongue is a rare affection, occurring oftener in children under six, and occasionally in adults. The condition may appear or disappear quickly. Beginning as a small, grayish patch, irregular in outline, with raised border of a bright yellow color, the patch clears in the centre, leaving a smooth, almost glossy appearance. The lesions are slightly if at all painful, are confined entirely to the tongue, and generally several spots are present at the same time.

The first and second stages of syphilis are constant, presumably occurring in all cases, but occasionally passing unnoticed so that late lesions are the first to be recognized. This is more apt to occur in women than men.

In regard to the third stage—many cases are apparently cured before they reach this period; if not, the lesions shown are localized instead of general, deep, destructive, and heal, leaving permanent scars. What is true of the skin is also true of the tongue and mucous membranes. The characteristic lesions of the third stage are the gumma and large ulcerating papules. Late ulcers, especially on the hard and soft palate, are often serious. When situated on the soft palate, they not only result in deformity from the destruction of tissue, but from the contraction of the scars as well. However, it is from lesions on the hard palate that the greatest trouble arises. Ulcerations there destroy both soft tissue and bone, forming perforations into the nasal cavity, with all the consequent annoyance in eating and talking. The process may extend to the destruction of the septum and nasal bones, giving the characteristic deformity of a sunken bridge, the stamp of the disease so much feared by syphilitics.

It is in these cases of perforation of the hard palate that you so skillfully make a plate with obturator filling the opening, and sometimes lift a fallen bridge and hold it up with a support from the plate. In perforations of the soft palate there is nothing to be done except perhaps a surgical operation.

It was formerly believed that late lesions were never a source of infection. This, however, is not true, as *spirochæta-pallida* are occasionally found in small numbers in very late ulcerations. There is another lesion that occurs in the mouth at this stage of the disease and usually upon the dorsal surface of the tongue—the gumma. It begins as a small firm nodule in the tissue and gradually enlarges, the centre softening and finally discharging through a small opening. Without treatment these lesions may continue to come and go for a long time, healing, leaving small scars.

Acute periostitis, especially of the long bones, tibiæ, ribs, sternum, etc., occurs, both in the secondary and tertiary periods. The swelling is extremely tender and painful, especially at night. When the periostitis is situated near joints, it is frequently mistaken for rheumatism. In children with inherited disease, this is thought by the parents to be "growing pains." In some cases there is actual production of new bone. The process may occur anywhere. In a case seen recently, it affected the under jaw and for months was considered neuralgia.

Syphilis is not only transmitted from one individual to another, but to the offspring as well. Some of its most malignant effects are seen in the product of conception during the early stages of the disease. It is responsible for many miscarriages, still-births and early infant death. In thirty syphilitic families with a total of 168 pregnancies, there were fifty-three miscarriages and seventy-one living children. Inherited syphilis usually shows at birth or within a few months, and may continue to recur in one way or another for many years.

We saw a woman recently, forty-eight years of age, with an acute interstitial keratitis. She had had previous trouble with her eyes and her throat showed scars from old ulcerations. There was one typical Hutchinsonian tooth remaining and her blood test was strongly positive! There is little doubt but that her dis-

ease was inherited, interstitial keratitis being common in inherited and very rare in the acquired disease.

Another case—a woman of forty-two: Out of seven pregnancies she and a sister alone survived infancy. She has had trouble with her eyes, is deaf, and has typical Hutchinsonian teeth, as well as numerous scars in the throat. The Wasserman test, however, in her case was negative. She has had but one child, who is said to be healthy, now grown up and married. If possible, we will keep the daughter and any children she may have, under observation for signs of transmission “to the third and fourth generation,” which, I believe, rarely if ever, happens. I have never seen such a case, although there have been a few reported. However, the possibility of syphilis of the third generation is an open question.

Aside from the absence of the primary stage, congenital syphilis shows the same general manifestations as the acquired. Early and late skin eruptions occur and involvement of eyes, ears, bones and the nervous system are common. Late destructive processes of the hard and soft palate are seen, the same as in acquired disease, and mucous patches come and go, in and about the mouth, during the first years of life. These children may be backward in mental and physical development as well as in teething, walking and talking. Some lose much time from school on account of trouble with eyes and ears, and they are sometimes considered stupid simply because they do not see and hear. At no time has there been the concerted action to help this most unfortunate class as at present. A certain number also, have late enlargement of the cervical glands and are treated as tuberculous, or, in the past, have been considered as “scrofulous.” The improvement of many of these children under anti-syphilitic treatment is most remarkable.

As you know, the typical Hutchinsonian tooth is broader at its base than at the cutting edge, giving it a peg-shaped appearance. The enamel fails to fully cover the dentine, allowing the latter to wear away, leaving the characteristic notch. Not only are these teeth poorly developed, but they are poorly placed in the jaw as well, being often widely separated. There is frequently a failure in development of the upper jaw, making it im-

possible for upper and lower incisors to meet. These teeth are an example of the so-called para-syphilitic manifestations, a condition syphilitic in origin, but not syphilitic in character, and not modified by treatment. It is never safe to make a diagnosis of inherited syphilis on Hutchinsonian teeth alone—they are usually accompanied by interstitial keratitis, a chronic inflammation of the cornea and deafness of central origin. The changes Mr. Hutchinson described, apply only to the upper central incisors of the permanent set. The first set may be fragile and decay quickly. Other teeth of the permanent set may also be poorly developed, showing the effect of marked nutritive changes—but they are *not* Hutchinsonian.

In regard to treatment:

Syphilis is, I believe, a curable disease. To insure the best results, the treatment should be begun as soon as the diagnosis is established. By finding spirochaetes or a positive Wasserman reaction, it is now possible to make a diagnosis much earlier than formerly, when it was necessary to wait for the appearance of secondary manifestations.

Aside from general hygienic measures, there are only three drugs of especial value in the treatment of syphilis—and but two of these approach a specific—mercury and 606. Iodine and its various salts has been much used alone and in combination with mercury. While it has a most wonderful effect in absorbing syphilitic products, it cannot be regarded as a specific. It does not *cure* the disease. In salvarsan or neo-salvarsan we have a most valuable remedy. Invented by Ehrlich to destroy syphilis, it was at first claimed that a single massive dose was all that was necessary to cure the individual. While this claim has by no means been realized in all cases and the method of administration and dosage has been changed to repeated smaller injections, it still promises to be of greatest assistance in our conquest of the disease. It has, as yet, by no means supplanted mercury, but is its most valued ally and can be used with good effect in both early and late stages. The results are equal, in cases that have, or have not been previously treated with mercury. Some of the most striking improvement has taken place in patients who

showed little or no benefit from mercury—the so-called mercury resistant cases.

Beside the direct effect upon the disease, there is often a marked improvement in the patient's general condition; one case gained thirty-three pounds in forty days after the injection!

Two points of interest to the practising dentist are: First—How to prevent accidental infection from patients; and Second—How to avoid carrying infection from one patient to another.

It is quite impossible for you all to be syphilographers—but to the first question this is the answer. Constantly bear in mind the possibility of syphilis in any mouth. Before beginning your work make a careful inspection with the aid of a wooden tongue depressor, of the entire mucous membrane of cheek, gum, tongue and throat. Of course, usually nothing will be found. If lesions are present that are suspicious you can either get help from someone or take extra precautions in regard to the condition of the skin on the hands, especially about the nails, remembering that spirochætes do not penetrate unbroken skin. Syphilis is rarely if ever contracted from a recognized syphilitic. If lesions are present and the demand for dental work imperative, rubber gloves may be worn.

The answer to the second question is easy and certain: Thoroughly sterilize all instruments by boiling for at least twenty minutes. The addition of bicarbonate of soda to the water will prevent rusting. Immersion in 70% alcohol for the same length of time is also doubtless effective and does not spoil a cutting edge. Dipping instruments in a solution of carbolic acid or other antiseptic may be efficacious, but there is great danger of the dipping being too brief and superficial. The sense of security from boiling or the use of alcohol amply repays for the additional time and trouble

EARLY HISTORY OF NEW YORK STATE AND DISTRICT DENTAL SOCIETIES¹

BY WILLIAM CARR, M.D., D.D.S., NEW YORK CITY.

The origin of the State Society and of the District Societies of the State of New York resulted from a convention of dentists that met in the City of Utica, N. Y., on December 17, 1867, under the leadership of Dr. A. Wescott, of Syracuse, and Dr. B. T. Whitney, of Buffalo. This convention was called to ascertain whether it seemed advisable, at that time, to make an application to the Legislature for the passage of a law that would protect our profession and would enable it to create legal organizations.

It was the consensus of opinion of those present that this should be done and a committee, consisting of Dr. A. Wescott, of Syracuse, Dr. B. T. Whitney, of Buffalo, and Dr. L. W. Rogers, of Utica, was authorized to draft a bill for this purpose and to present it to the Legislature.

The committee received encouragement from many dentists and physicians throughout the State, but at the same time it had many bitter opponents among the rank and file of the profession, and these made an organized effort to defeat the bill when it was presented to the Legislature. Had it not been for the influence of Dr. A. M. Holmes, of Morrisville, then State Senator, who was in favor of the bill, it would have been defeated.

The first law enacted made provision for the organization of the State Dental Society, but the State Dental Society was not organized until the organization of the District Societies. The law required that at least fifteen dentists, residents of the several judicial districts of the Supreme Court of this State, would be necessary to organize each District Society, and that delegates from these Societies were to organize the State Society. In compliance with the provisions of the act of the Legislature, passed April 7, 1868, a meeting of dentists of this district was called in the City of New York, meeting at Cooper Union, Room 24,

¹ Address at the annual banquet of the First District Dental Society of the State of New York, held at the Hotel Astor, Saturday, January 18, 1913.

Tuesday, June 2, 1868, at 2 o'clock. There being sixty persons present claiming to be dentists, fifteen being the required legal number to organize, the meeting was called to order by Dr. J. G. Ambler, a prominent practitioner of this city. On motion of Dr. W. C. Horn, Dr. O. A. Jarvis was elected President pro tem, and on motion of Dr. A. C. Hawes, Dr. William C. Horn was elected Secretary pro tem. The temporary organization being completed, the President pro tem stated that there were assembled more than fifteen dentists, residents of the City of New York, at the time and place as indicated by the law, and that the first business now before the house was the election of permanent officers for one year or until others had been chosen. The organization proceeded at once to elect a President. Drs. A. L. Northrop, J. H. Foster, John B. Rich and J. B. Ambler were nominated for President. Drs. Foster, Rich and Ambler declined to serve. A vote was taken and Dr. A. L. Northrop was unanimously elected as the first President of this Society. The nominees for Vice-President were Dr. A. C. Hawes and Dr. William H. Atkinson. Dr. Atkinson declined, a vote was ordered, and Dr. A. C. Hawes was unanimously elected. Dr. W. C. Horn was unanimously elected Secretary and Dr. E. G. Roy was unanimously elected Treasurer. The President pro tem then declared that, by authority of the State of New York, this meeting of dentists was constituted a body corporate under the name of the District Dental Society of the First Judicial District of the State of New York. The President elect, Dr. A. L. Northrop, took the chair, and stated that the first business in order was the election of eight delegates from this Society to meet at the Capitol in the City of Albany on the first day of June, 1868, for the purpose of organizing the State Dental Society. Dr. John B. Rich moved that the delegates be nominated and elected one by one, and that votes should be taken by ballot. This motion was carried. The President appointed as tellers Dr. C. F. Ives and Dr. J. C. Abrams.

The balloting shows that even at this early stage of the organization there was not complete unanimity, as it required several ballots in each instance to elect a delegate. There were exciting contests in electing the delegates—sharp parliamentary

tactics being resorted to. This was so pronounced that Dr. Norman W. Kingsley moved that "a majority of all votes cast shall elect on the first ballot and that failing an election on the first ballot the vote on the second ballot should be confined to the two names receiving the greatest number of votes on the first ballot." This motion was carried, whereupon Dr. John B. Rich moved that "nominations be dispensed with." This motion was carried and gave the house the privilege of voting for any member present without nominations.

The following delegates were elected to attend a meeting at Albany for the purpose of organizing the State Society: Drs. J. Smith Dodge, O. A. Jarvis, William C. Horn, John Allen, J. G. Ambler, E. A. Bogue, William H. Atkinson and William Carr.

Upon the chair declaring these members elected, Dr. John B. Rich raised the point of order that as Dr. J. Smith Dodge was not a member of this body, not being present, he was not eligible as a delegate from this Society. The President decided the point of order well taken, and Dr. A. C. Hawes was unanimously elected in his stead.

It was moved by Dr. William H. Atkinson that this Society hereby declare this to be the first annual meeting, and on motion of Dr. E. A. Bogue, it was resolved that if any delegate or censor at this meeting fails to qualify, his place be filled by the President. The motion was carried. The meeting adjourned to meet at 8 o'clock at Cooper Union on the first Tuesday in July, this being July 7.

The second meeting of the Society met at Cooper Union; a quorum not being present, it adjourned from the 7th to the 21st of July, 1868. On this date, there being twenty members present, thirteen making a quorum, the Secretary stated that he had filed the minutes of the organization with the County Clerk, as required by law, and the State Society having been organized, a report of the delegates to the State Society was read and ordered to be recorded. The President announced at this meeting that he had appointed Dr. William C. Horn a delegate of the State Society instead of Dr. John Allen, who was unable to be present. Dr. John B. Rich moved that a committee be appointed to draft constitution and by-laws of the Society. Practically all

of the year 1868 was given to the appointment of the committees and the drafting of constitution and by-laws. During that year, members, one after the other, resigned, and finally the committee, without making any report, was discharged, and a new committee appointed to draft constitution and by-laws. A committee on by-laws did not report until the 30th day of December, 1868. Upon resolution of Dr. Horn, it was resolved that the by-laws, as presented, be adopted for the governance of the Society until otherwise ordered.

At this meeting, on motion of Dr. Rich, delegates to the American Dental Association were appointed. Dr. Rich moved that an assessment of \$4.00 be laid upon each member to defray the necessary expenses of the same and to be credited to their dues. The motion was carried.

At the second annual meeting Dr. A. C. Hawes was elected President, Dr. J. G. Ambler, Vice-President, and the Board of Censors required by law was elected. It consisted of Drs. Bronson, Francis, Bogue, Varney and Carr, making the first Board of Censors of the District Society.

At a meeting on June 23, 1869, a resolution was offered by Dr. O. A. Jarvis as follows: "*Resolved*, That as the members of the medical, legal and clerical professions are exempt from jury duty, a committee be appointed to ask the Legislature to exempt the dental profession also." This motion was seconded by Dr. Carr and carried. Drs. J. G. Ambler, E. A. Bogue, W. C. Horn, C. E. Francis and O. A. Jarvis were appointed a committee to apply to the Legislature for an act exempting all registered dentists from jury duty. At a subsequent meeting Dr. Kingsley was added to the committee, March 5, 1872. He reported that, after having been in Albany several times and having given the matter earnest attention, he hoped eventually to succeed; he also stated that he considered this Society should recognize his services in this matter. Thereupon Dr. J. S. Latimer offered the following resolution, which was passed: "*Resolved*, That in case of the passage of the law exempting dentists from jury duty in the City of New York, this Society guarantee to Dr. N. W. Kingsley, in

recognition of the value of his services in the matter, the sum of five hundred dollars (\$500.00)."

Dr. Kingsley reported at the annual meeting in 1872 that a law exempting dentists from jury duty in the City of New York was passed on the 9th day of May, and Dr. Bogue immediately offered a resolution that the Society pledge themselves to the sum of \$10.00 each in order to pay Dr. Kingsley \$500.00 for assisting in having the law passed exempting dentists from jury duty. A committee of five, Drs. Latimer, Bogue, Miller, Abbott and Albert, was appointed to collect the money.

At a meeting on June 23, 1869, steps were taken, on motion of Dr. Atkinson, to have regular essays read, and a committee was appointed, consisting of Drs. Francis and Bronson, for the purpose of securing essays.

During 1868 and 1869 meetings were held weekly and bi-monthly. At many of these meetings, for various reasons, there was not a quorum. We either had to adjoin or to fall back upon the custom of the House of Representatives, which assumes that a quorum is present until advised to the contrary. Many meetings were held under this assumption.

At the meeting of January 26, 1869, Dr. Atkinson advocated the establishment of a dental clinic. A committee, of which he was chairman, was appointed to arrange for clinics.

On June 23, 1869, Dr. Atkinson reported that he had made arrangements for clinics to be held on the afternoons of the second and fourth Wednesdays of each month from two until four o'clock, at the S. S. White Dental Depot, and announced that the honor of giving the first public clinic under the auspices of this Society would be conferred on Drs. C. E. Francis and E. A. Bogue.

Other clinics following were given by Drs. Roy, Jarvis, Bronson, J. S. Latimer, Atkinson, Carr, Barnum, Grant, Perry, Varney, Palmer, Mills, C. E. Latimer, Hanks, Davenport, Barnes, Oldham, Robbins, Hodson, Glenny and Wilson.

The average attendance was twenty, but often only ten or fifteen members were present. The greatest number present at any time was fifty.

No change was made until March 8, 1871, when Dr. Lati-

mer, then Chairman of the Clinic Committee, reported that no clinic had been given since September 14, 1870, and that the members of the profession seemed unwilling to give clinics. The last one given was by Dr. C. E. Francis and Dr. Barnes, the attendance being twenty. From that time the clinics were abandoned for several years.

On April 27, 1870, Dr. N. W. Kingsley read to the Society the act that had just been passed by the Legislature, empowering the State Board of Censors to confer the degree of M. D. S. (Master of Dental Surgery) upon those who had passed a satisfactory examination. This act was severely criticised by Dr. W. H. Atkinson and others. Dr. Atkinson said that he thought it "inconsistent to appoint men to judge of the qualifications of others when they themselves were not qualified"—that "we ought not to try to elevate ourselves by such means."

It is regretted that during the years of 1868, 1869, 1870 and 1871 no records of discussions were kept; nor was any attempt made to do so until Dr. S. G. Perry became Secretary. During this period many of the meetings lacked a quorum, and this want of interest led to the organization of the Odontological Society. The continuance and subsequent success of our District Society was mainly due to the professional pride of Drs. Atkinson, Francis, Bogue, Northrop, Hawes, Jarvis, Kingsley, Horn and two or three others. The membership greatly increased in the latter part of 1871 and throughout 1872, with a corresponding degree of interest. The enthusiasm of our own members was communicated to some of the ablest men of the profession in other States, who favored us with papers and discussions and who contributed greatly to the renewed success of the Society. Among these men were Drs. Shepherd, Hitchcock and Moffatt, of Boston; Drs. McManus and Riggs, of Hartford; Drs. McQuillen, Garretson, Stellwagen, Foster and Truman, of Philadelphia; Dr. Morgan, of Tennessee, and Dr. Taft, of Michigan.

We are proud of the achievements of many of the members of our Society, whose influence has been felt both here and in foreign countries. Some of them have made valuable contributions to the profession. Among these are Dr. Atkinson with the

mallet and Dr. Barnum with rubber dam. Some have become famous as orthodontists. Of these, Drs. Farrar, Jackson and Daly originated their own special systems, while others, equally successful, have made enviable reputations by the use of systems devised by others.

In both general and specific subjects, many of our members have enriched dental literature. Dr. George Evans has contributed an unsurpassed treatise on "Crown and Bridge Work," of such great merit that the book has been translated into many languages.

Owing to the energy of other men, several dental clinics have been established in this city, the first important one being at St. Bartholomew's Mission, under the direction of Dr. J. Morgan Howe. It is now under the supervision of Dr. Wheeler, who was the first to offer his services at this clinic, where he has remained for three years with a staff of about a dozen other practitioners. The success achieved here demonstrated to Dr. Wheeler's mind the necessity for other clinics. Consequently, he established the second dental clinic at the Children's Aid Society, with the assistance of Mr. Charles Loring Brace, the Superintendent, who agreed to furnish a room and give financial assistance. This clinic is now under the direction of Dr. Merritt. The great necessity for clinical work among the poor children of this city was thus demonstrated even more clearly than before.

In 1907 Dr. Brennan, President of the Board of Trustees of Bellevue Hospital, suggested the desirability of adding a dental department to the Hospital. Dr. Wheeler established the clinic there also, and had a resident dentist appointed through competitive examination. This clinic became so successful that dental clinics have been established in all the Allied Hospitals under the direction of the President of this Society. Meanwhile, with the assistance of several of our members, and with the co-operation of the Board of Education, an examination was made of the teeth of children in the public schools, showing that fully 60 per cent. of the pupils were in need of dental services.

The hearty co-operation of Dr. E. J. Lederle, Health Com-

missioner of the city, and Dr. Eugene Porter, Health Commissioner of the State, and other officials of the city and State departments was secured, and through the persistent efforts of Dr. Lederle, the Board of Aldermen and other officials authority has been granted and money appropriated to employ dentists in the Department of Health to carry on this important work. As a beginning, twelve dentists have been appointed in the first division of Child Hygiene, one of these being detailed to the Otisville Sanitarium and one to the division of Communicable Diseases. We agree with Dr. Wheeler that this is the most important step in solving the problem of dental hygiene among the children of the poor in the schools that has as yet been taken.

In view of what has been accomplished by this Society, let us vie with each other in continuing to advance, and in making it one of the greatest societies of the age.

CONCERNING DENTAL LEGISLATION¹

BY DR. WILLIAM P. COOKE, Boston, Mass.

The primal object of the laws passed by the various States to regulate the practice of dentistry has been to give the public a better dental service. There is a marked difference between the method taken by the Canadian Provinces and the method of our Government. The Canadian laws place the control of the dental act in the hands of the dental profession. In many of our States the dentists have no voice in the appointment of the members of the Board of Examiners. In eighteen of the States, the State dental society nominates a list of persons and the Governor appoints from this list.

The Canadian method is much more democratic. The dental law forms a dental association or society, each dentist belongs to it, he has a vote, and the board or council is elected by the dentists. This method takes the matter out of politics and, if the dental profession is not represented by the best men, it is their own fault. This is the method of the ten Canadian Provinces whose laws I have examined. Each member of these societies must pay an annual fee of from one to ten dollars. If this fee is not paid they cannot vote and have no right to practise. The Registrar publishes yearly a list of all the dentists who can legally practise. The educational requirements of the Canadian dental laws are uniformly high; eight Provinces require the applicant for examination to be a graduate of an approved dental college and the other two Provinces relieve graduates from examination. They also have a provision for revoking a license for cause. Their penalties are likewise sufficient. There is more uniformity in the Canadian laws than in ours.

The standard of their examination is good, as the subjects in which the applicant is to be examined are given in their law. I will compare some of the standards of dental laws in our country with each other and with the Canadian laws.

Maryland passed a dental act in 1866; New York, 1868;

¹ Read before the American Academy of Dental Science, Jan. 4, 1913.

New Jersey in 1873; Georgia, 1879. The Massachusetts law was passed in 1887. Dental laws were passed in twenty-one States before the law of our State was passed, and two other States passed laws the same year. These laws have all been amended. Our law has been improved but little. Some of the items the board has wished to have placed therein have been refused by the Legislature.

I think you will agree that we have never had the profession and the state board working in unison. If the board suggested a thing, it has been regarded with suspicion. If the profession suggested a change, they have been looked upon as taking an interest in a matter that was not in their province. Our dental law, conceived in jealousy and passed in a spirit of intolerance, has never had the respect that a dental statute should have.

The methods of creating the examination boards may cast some light upon this situation. In Canada the choosing of the boards is placed in the hands of the dental profession. A dentist by his vote becomes a partner in the creation of the board that is to represent him. In our country in 18 States the board is non-political in its creation, as the Governor appoints the board from a list of men who are nominated by the State society. In 28 States the Governor has the whole appointing power. In one State the board is appointed by a commissioner, in another by the the Board of Health, and in a third by the Board of Regents. Thus, in eighteen out of forty-nine States and Territories the dental profession has a part in the creation of the board, and in twenty-three the Governors have all the appointing power.

In some of our States, the subjects in which the examination is to be given, are stated in the dental law; this establishes a standard, though in other States and Territories, the subjects are given in the rules made by the board. In our country, in 23 laws the subjects are stated, in 26 they are not stated.

In the matter of examination fees, 23 States charge \$25. In 13 the fee is \$20 or less. In twenty-five States the penalty for violation of the law is higher than in Massachusetts. In California, Pennsylvania and Montana the penalty may be \$1,000.

The published expense account varies in different States. In Massachusetts the financial statement for 1911 is composed

of the two items, received, \$3,618; paid, \$3,602. The California financial statement is very complete. They give items, and the items of "attorney and detectives fees, amounting to \$2,434 in 1910 and in 1911 \$1,495," show why they have \$550 and \$600 received from fines in the same years. In the annual license fee account, California reports nearly \$4,000 annual receipts, and \$475 and \$800 received from dentists who allowed their licenses to lapse.

In New Jersey the law calls for an annual registration of each dentist and each assistant in the office. There is no fee for this, but a fine of \$10 for failure to register.

I have said that in Canada, in eight of the ten Provinces, the dental laws require the applicant for the State dental examination to be a graduate of a dental school, and while this fact does not complete an argument, it is good testimony to the method of education.

In 49 States and Territories of our country I find that a person must be a graduate of an approved dental school in 36; in 6 others the restrictions are such that a person would usually take a college course. In the 7 remaining States a person can take the board examination without this training. These seven States are all the New England States, except Connecticut; to these add North and South Carolina. The laws of these five New England States seem to me to be lacking in most of the excellent features of some of the laws of more recent date.

It has been the boast of Massachusetts that any person could come before her various boards and be examined and, if qualified, be licensed. If law, this is a matter that deals with books and does not touch the interest of the human body and no one is hurt. In the training of persons in dentistry, our State has said that as this part of the education requires the gaining of manipulative skill by practise upon the human body, it is not right that this should be done without supervision. Dental schools are therefore given this duty; the old preceptor method has been laid aside. There must be some foundation for this or 35 States would not put it into their law.

The report of our State board for the year 1911 shows that out of 37 non-college graduates examined there were five who

passed the examination, and these passed not on the first trial, but on the second, third, fifth and sixth trial. These men had secured their livings in the meantime. Do you suppose they were careful not to break the dental law?

Every person who has experience with dental students knows that often a student will not do his best to secure his degree, since he knows that he can take the board examination without being a graduate. Why should the State through its board authorize a man to practise dentistry, who has not enough preparation to pass his dental college examinations? The actual knowledge a person secures is only a part of what he gains from his dental course: the mental training which enables him to consider a professional subject clearly, the ability to place his talents effectively beside those of the men in his profession, these are other advantages that come to the man who has the uniform training of the dental schools.

If the supervision of the State through dental legislation means anything, it should mean the assurance of the best possible product in the dentists who are to serve the public.

Annual Registration.

Section 14. "For the purpose of correcting and revising the register of legal practitioners of dentistry, as kept by the State Boards of Dental Examiners, it shall be the duty of each person registered or licensed by the board to practise dentistry in this State, to procure from the secretary of the board, on or before November 1, 1909, and on or before November 1st thereafter, a certificate of registration. Such certificate shall be issued by the secretary upon payment of a fee to be fixed by the board, not exceeding the sum of one dollar."

The above quotation from the dental law of Illinois suggests a very good reason for the annual registration of dentists. We have a list of the registered dentists of Massachusetts, published January, 1912. This contains 2,992 names; it is the production of the secretary of the State board, who has been secretary for many years. There are at least 257 names of persons who have died or who have moved out of the State; without doubt there are many more whose names should not be on the list. In the

years 1908, '09, '10, '11 the Massachusetts State board reported 54 deaths, and then in the list of registered dentists for 1912 publishes 21 of these persons as alive.

This condition is not due wholly to the careless work of the secretary, but to the present method of dental supervision. We cannot expect to have any better enforcement of the dental law until the dental profession know by the published reports of the board who the legal dentists are. You can easily see how the publishing of an annual list of the names and office addresses of all dentists registered in the State, arranged alphabetically by names and by cities and towns in which their offices are located, would enable the profession to help in law enforcement.

Aside from the question of money for the prosecution of violators, the publication of the list would aid in the observance of the law.

Compare the lists of dentists published by Massachusetts and Iowa, Virginia, California, Montana, in which we have lists by cities, towns, and also alphabetically. This comparison is sufficient proof that we need annual registration.

An arrangement for exchange of certificates, so a man who for cause wishes to move from one State to another can do so without a new examination, is included in the laws of several States.

A more uniform definition of what the practice of dentistry consists of would help in law enforcement.

The Dental Law of Massachusetts.

I think the following suggestions would improve our law:

1. The creation of the board should not be a political act.
2. The education standard should be raised, requiring a college degree as a qualification for examination.
3. The examination fee should be \$25.
4. The financial account should contain the items.
5. We should have an annual registration of dentists and office assistants.
6. The board should have power to revoke licenses for cause.
7. Establish an exchange system of certificates.
8. The definition of dental practice should be reworded.

9. A rewriting of the act after a careful study of the laws of other States.¹

Registration Fees in Canada.

<i>Province</i>	<i>Annual Fee</i>
Alberta	\$10.00
British Columbia.....	10.00
Manitoba	2.00
New Brunswick.....	3.00
Nova Scotia.....	3.00
Ontario	3.00
Newfoundland.....	Board has power to fix the amount
Prince Edward Island.....	5.00
Saskatchewan	1.00 and upwards
Quebec	5.00

The Dominion Dental Council is formed to secure and maintain "a uniform standard of education and ethics for the different provinces of Canada, and granting certificates to those passing such examinations."

Registration Fees in the United States.

Dentists in the following States must register annually and pay registration fee:

<i>State</i>	<i>Fee</i>	<i>Fee to Reinstale License</i>
Arizona	\$1.00	
California (money used for prosecution).....	2.00	\$25.00
Idaho	2.00	10.00
Illinois	1.00	20.00
Kentucky	1.00	5.00
Michigan (special fund to enforce act).....	3.00	25.00
Minnesota	1.00	5.00
Missouri	1.00	25.00
Montana (penalty for violation of act, \$500-\$1,000)	4.00	
Nevada (to be used exclusively for prosecution).	2.00	10.00
New Jersey (no fee).....		10.00

¹Since this paper was read on January 4, the proposed new dental law for Michigan has been published in the "Items of Interest," and an act has been submitted to the Massachusetts Legislature that contains the provisions of the Michigan law adapted to Massachusetts statutes. The provision of exchange of certificates, not in the Michigan law, is in the proposed Massachusetts law. The Michigan act contains all the other points above suggested. These are all provisions of dental laws already in force in the United States. The Michigan and Massachusetts acts are simply a compilation of the best features of existing dental laws. Both should be enacted.

New Mexico (money to enforce act).....	3.00
North Dakota.....	2.00
Oklahoma	1.00
Oregon (special mention that money be used to enforce act).....	1.50
South Dakota.....	2.00
Utah	1.00
Virginia (funds to enforce act).....	1.00
Washington (funds to enforce act).....	1.00
Wisconsin	1.00
Connecticut (no fee, but must re-register if den- tist changes his residence).	

Twenty States re-register annually with a fee from \$1-\$4.

In eight States the fees are used to enforce the act.

Dentists in the following States must register their license with the clerk of the county court and pay a specified fee:

<i>State</i>	<i>Fee</i>	<i>Fine</i>
California	\$0.50	\$25.00
Florida		15.00
Alabama	1.00	
Arizona	0.50	6.00
Arkansas	1.00	
Georgia		10.00
Idaho	1.00 (annually)	
Illinois		15.00
Indiana	0.50	
Kentucky	0.50	10.00
Louisiana	1.00	
Michigan	0.50	25.00
Minnesota	1.00	
Mississippi	1.00	
Missouri	0.50	25.00
Montana	1.00	
Nebraska	1.00	25.00
Nevada	0.25	25.00
New York.....	0.25	
North Carolina.....	0.25-0.50	25.00
North Dakota.....		
Oklahoma	0.50	
Oregon	1.00	
Utah	2.50	25.00
Vermont	0.50	25.00
Virginia	0.50	50.00
Washington	1.00	

Wisconsin	1.00
Wyoming	1.00

Methods of creating examining boards of registration in dentistry.

<i>States</i>	<i>Methods</i>
Alabama	Elected by the State Society.
Arizona	Appointed by the Governor.
Arkansas	Recommended by the State Society.
California	Appointed by the Governor.
Colorado	Three of five appointed from list approved by the State, two at the pleasure of the Governor.
Connecticut	Appointed by the Governor.
Delaware	Appointed by the Governor.
District of Columbia.	Appointed by Commissioners.
Florida	Recommended by the State Society.
Georgia	Recommended by the State Society.
Idaho	Appointed by the Governor.
Illinois	Appointed by the Governor.
Indiana	One by the Governor, one by the State Board of Health, three by the State Society.
Iowa	List sent in by the State Society to the Governor.
Kansas	Appointed by the Governor.
Kentucky	Chosen from list of names nominated by the State Dental Society.
Louisiana	Appointed by the Governor.
Maine	Appointed by the Governor.
Maryland	Appointed by the Governor from list of names chosen by State Society.
Massachusetts	Appointed by the Governor.
Michigan	New law calls for nomination by State Society.
Minnesota	Four members recommended by State Dental Society.
Mississippi	Appointed by the Governor.
Missouri	Appointed by the Governor.
Montana	Appointed by the Governor.
Nebraska	Appointed by State Board of Health.
Nevada	Appointed by the Governor.
New Hampshire.....	Appointed by the Governor.
New Jersey.....	Names recommended to Governor.
New Mexico.....	Appointed by the Governor.
New York.....	Appointed by the Regents.
North Carolina.....	Members of and elected by the State Society.
North Dakota.....	Three of five members by a recommendation of the State Society.
Ohio	Appointed by the Governor.

Oregon	Appointed by the Governor.
Pennsylvania	Public officers stated by law; president of State Dental Society is one of them.
Rhode Island.....	Appointed by the Governor.
South Carolina.....	Elected by the State Society
South Dakota.....	Three members from list approved by the State Society.
Tennessee	Appointed by the Governor.
Texas	Appointed by the Governor.
Utah	Appointed by the Governor.
Vermont	Appointed by the Governor.
Virginia	Appointed from State Society list.
Washington	Appointed by the Governor.
West Virginia.....	Appointed by the Governor.
Wisconsin	Appointed by the Governor; three must be members of the State Society.
Wyoming	Appointed by the Governor.
Porto Rico.....	Appointed by the Governor.
Recapitulation	Eighteen non-political—from State Society. Twenty-eight appointed by Governor. One by Commissioner. One by Board of Health. One by Regents.

In the following States an applicant for the Dental Board examination must be a graduate of an approved dental college:

<i>States</i>	
Alabama	
Arizona	
Arkansas	Graduate need not be examined.
California	
Colorado	
Connecticut	
Delaware	Applicant must also file his photograph.
District of Columbia.	Graduates of <i>three-year</i> schools not examined.
Florida	
Georgia	
Idaho	
Illinois	
Indiana	Applicant must be a graduate or have been a dentist's assistant for five years. No discrimination in examination against those who have no diploma.
Iowa	
Kansas	
Kentucky	

Louisiana	
Maine	New law to include graduate provision.
Maryland	
Michigan	
Minnesota	
Mississippi	
Missouri	
Montana	
Nebraska	Applicant must be a graduate or else present a diploma from a <i>four-year</i> high school and have served a five-year apprenticeship of twelve months each under a licensed dentist of Nebraska.
Nevada	
New Jersey.....	
New Mexico.....	
New York.....	
North Carolina.....	Graduates not examined.
North Dakota.....	
Ohio	
Oregon	
Pennsylvania	
Rhode Island.....	Graduate amendment failed to pass in 1911.
South Dakota.....	
Tennessee	
Texas	Information about college degree required.
Utah	Applicant must be a graduate or a three-year student.
Virginia	After 1914 applicant must also be a graduate in medicine.
Washington	
West Virginia.....	
Wisconsin	
Wyoming	
Porto Rico.....	
Vermont.....	Graduate amendment to be included in new law.
Recapitulation	In thirty-six States applicant must be a graduate. In six States he is practically required to be a graduate. In seven States he need not be a graduate.

An amendment requiring an applicant for the State Board examination to be a graduate of an approved dental college, was defeated in Rhode Island in 1911 and in Massachusetts in 1912. This amendment will be asked for in Maine, New Hampshire, and Vermont this year. North and South Carolina have not within my knowledge asked for this amendment.

REPORTS OF SOCIETY MEETINGS

FIRST DISTRICT DENTAL SOCIETY OF THE STATE
OF NEW YORK, DECEMBER 2, 1912.

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, December 2, 1912, at the Academy of Medicine, 17 West Forty-third Street, New York City.

The president, Dr. Herbert L. Wheeler, occupied the chair, and called the meeting to order.

Dr. Nelson T. Shields read a paper, entitled "Trifacial Neuralgia: Symptomatology and Clinical Treatment."¹

Dr. Harold S. Vaughan read a paper on "Oral Infection by Vincent's Bacteria and its Importance to the Dental Practitioner."²

Discussion of Dr. Shields's Paper.

Dr. John A. Bodine—Mr. President and Gentlemen: I expected to have a patient here to show you, upon whom I have performed the operation of avulsion of the posterior root of the fifth nerve; but, as the weather is so bad, I am not sure she will come, as she is quite old. However, she may be here later.

I do not suppose Dr. Shields would have asked me to discuss this paper, if he had not known in advance I would disagree with him. I do disagree with him, and then acknowledge a debt.

I cannot conceive how the extirpation of the pulps of those teeth, although dental irritation is an admitted cause, will make a permanent cure, while surgeons go further—beyond the peripheral end and get only a temporary relief after all.

I believe Dr. Shields's cases will turn up again with neuralgia. It remains to be seen, of course, whether or not he is right. So much for disagreeing with him.

Ninety-nine per cent. of the trifacial cases that come to us for relief have been to the dentists. Of course, they are good, bad and indifferent dentists. Most of the patients have suffered

¹ See p. 5.

² See p. 11.

the loss of teeth, and still they have the neuralgia. It would seem that would do away with Dr. Shields's contention, but it does not. If, at the very beginning of the peripheral cause, you drew all the teeth in that mouth before the trouble is entrenched in the Gasserian ganglion, it would seem that it would be cured; but it is not. Dr. Shields says it is not, by removing the pulp from one tooth, but from all the teeth in the distribution of that nerve, and there he has a good case. The cause may be in one part and the ache in another.

Nowhere have I found this in surgical literature, or in my reading. I am glad to see Dr. Dawbarn here, for he reads everything. If there is one thing that impresses itself upon us in the tic douloureux cases—and there is a difference between minor neuralgias and tic douloureux—in the cases that affect the aged, and especially women in middle age, it is that in almost every case there is hardening of the arteries; and frequently the cause is then an impoverishment of the Gasserian ganglion, because of the hardening of the artery supplying its nutrition.

You have been shown that calcification can begin in the tooth. It may impinge on nerve film—the very beginning. The most painful thing you can have on the body is a blister, and yet it is only the thickness of the skin of an onion. The highest differentiation then of the fifth nerve is in the pulp. I can see how this calcification impinging on the nerve point can be the starting point of a neuralgia, even of a tic douloureux.

I believe Dr. Shields has added a possibility to the cause of trifacial neuralgia. While I disagree with him in the ultimate relief of the case, it is something I have never thought of, or seen in print. We know the teeth do have a great deal to do with the neuralgia, even in spite of failures we have seen after the drawing of all the teeth. Dr. Krousley says the teeth are often a cause of trifacial neuralgia, but we often fail to cure when we remove all the teeth. Whenever you remove an exposed pulp, there is a palpable cause. Although the tooth is sound, investigate it, and you will find an exostosis. He saw there might be something there, and yet he had not gotten this point, that there might be something in the canal.

It is something not easily explained, why the second and

third divisions are always affected, and so rarely the first. Ninety-nine cases, I think, out of a hundred—Dr. Keller here will bear me out—are affected in the second division, instead of the first. The second and third divisions have to do entirely with the teeth. If the extraction of the pulp will relieve—I do not say cure, though I hope Dr. Shields will have a permanent cure—if it will but relieve—he has a right to stand here and recommend it, as Dr. Dawbarn and I recommend peripheral surgery. If it will relieve for three or four years, it is as well as we can do. It is as much relief as we give. The only thing we have better is the avulsion of the root, and that is the only permanent cure we know of.

In the event of such a case appealing to me for relief, I would suggest everything in the way of hygiene, and therapeutics, and hydrotherapy, and electricity, and, failing in all those, I would turn to surgery. Of course, after hearing this paper tonight, I would recommend having every pulp removed, whereas I would not recommend every tooth to be drawn. Failing in that, I would recommend another surgical operation, which is not done with the knife, and that is the injection as has been mentioned.

I thought I might add to the interest of the evening, by showing an operation—on the head of a cadaver—as it is usually performed. After the close of the meeting Dr. Keller will stick this needle in, and will show you how accurately it can be done. You shut off all communication between that point and the brain by the injection of alcohol, and in fifty-nine cases there has been relief. In no case has there been a cure. It will come back in time. Some of the cases have gone two years, and some no longer than three months. Where the return of pain comes after three or four months, the patients get exceedingly tired of having the injection, although we use a slight anesthetic. When that fails, we turn to what is considered to be a permanent cure.

(Dr. Bodine's patient having arrived, he proceeded to describe the operation he had performed on her.)

This operation is not the Hartley-Krousley operation, although great credit belongs to them. It is the operation of removing a small button of bone right here, lifting up the anterior

lobe of the brain, and with reflected light you can see in there perfectly. When you reach the third division of the ganglion—the inferior dental—you take that as your guide, and work back until you come to the ganglion. Then you are in the middle fossa.

The old operation was exceedingly bloody, and they had a high mortality rate. If you go into the sinus which lies right next to the ganglion, the patient will probably bleed to death. We do not go as far as that. We go to the third, or posterior fossa. The patient gets out of bed after twenty-four hours, as this old lady did.

It is impossible for the peripheral portion to regenerate. You may see the deformity. You must say to the patient, as I did to this patient here: "You may die on the table." She said, "I would thank my God if I did." I said, "You may lose your eye." She said she did not mind losing one eye, if she were relieved, and could still see with the other; but she declared if I did not give her relief she would commit suicide; and I felt she would be justified—though perhaps not in the moral sense, after the excruciating agonies she had suffered. She has no facial palsy, but there is some interference with the supra-orbital. She can close her eye, and so far we have no ulcer of the cornea. You cannot see where the operation was done, and we were successful in not interfering with the muscles of mastication.

Dr. R. H. M. Dawbarn—I cannot add very much to the superb discussion of my friend and colleague, Dr. Bodine. This, however, I can say in favor of Dr. Shields's operation, in addition to the fact that it is entirely new—if it can become well known and be given a wide trial—perhaps in some hundreds of cases it may result in a great saving of the teeth, and hereafter all of us ought to advise our patients to have the pulps removed in the affected area, rather than to have the teeth extracted.

As Dr. Bodine says, most of these cases come to us with almost all the teeth gone, and yet no relief. I value even a half-sound tooth so much that I consider the sacrifice of those teeth at wholesale, an outrage.

Quite a striking point in favor of Dr. Shields's theory is the comparative rarity of involvement of the first branch of the tri-facial nerve—which has no distribution to the teeth.

Dr. Shields mentioned one point in physiology that is no longer taught. The gustatory nerves, I believe, are no longer considered as supplying the sense of taste to the tongue, in spite of the name.

In migraine there is some involvement of the tenth nerve, as well as the fifth, because almost invariably there will be quite violent vomiting—usually toward the ending of an attack. You may look forward to that hopefully—miserable as it is—because it is the end of an attack.

In many of these cases the first thing one should do is to call the oculist. In unilateral facial neuralgia, with headache too, I will venture to say that the eyes, in a large majority of cases, are the real cause; and if an oculist is present he would probably reverse the percentage Dr. Shields attributes to pulp stones, and put the trouble with the eye, particularly the muscular eye troubles. The radical relief consists in dividing, or dividing and advancing the muscles, as it may be necessary.

You have heard of Romberg, who defined neuralgia as being “a prayer of the nerves for more blood.” If he had said “a swear of the nerves,” he would have been nearer right!

In almost all cases of tic douloureux, if you will examine with a Fleischl's hæmoglobinometer, you will find distinct anæmia. If it is lower than ninety per cent. of the red, it is well to prescribe iron. Iron is not, strictly speaking, a medicine, but a food. Iron is a food, as much as beefsteak, and when found lacking in the blood it should be given in as large doses as the patient will tolerate—differing in this respect from the dosage of almost all other remedial agents. In that famous work, which I think is the best one written, Niemeyer's “Practice,” the author says he owes the great success of his practice in the treatment of cases suffering from these troubles, due to anæmia—including chlorosis, where a girl is greenish in appearance, to this method of treatment.

Niemeyer tells the story of a young German physician who traveled to his clinic, in order to inquire of him his secret for helping those cases of neuralgia. He told him to give freshly-made Bland's iron pills, increasing the dose every day. Instead of in-

creasing it in arithmetical ratio, as instructed, the young physician, misunderstanding, increased it in geometrical ratio—so that by the end of the week the patient was taking the pills several times daily, literally by the handful—with wonderful effect in the increase of red blood and a cessation of the neuralgia.

I would say as to the injection treatment with absolute alcohol, the trouble is, we have to give it almost without anesthesia, otherwise we cannot be sure it is done where it should be; and the agonizing pain when giving it properly causes a toss-up in the patient's mind as to which is preferable—the neuralgia or the injection. Still it is our best medical means with *tic douloureux* at present.

There is one point in the technique: Dr. Bodine has said, perhaps, the only difficult point is the extreme bloodiness of the operation before succeeding in tying the middle meningeal artery: On the cadaver, the operation is simple, because there is no bleeding. If instead of ligating the median meningeal, one should begin by ligating the external carotid—a thing which I have done nearly two hundred times—that difficulty would be obviated. It is a very easy ligation; and since it is the source from which the median meningeal artery gets its blood, it is no longer necessary to tie the latter. The external carotid is a very safe ligation, with no mortality in safe hands. In addition to doing that, one should in preparation for the operation which Dr. Bodine performed, use sequestration anæmia. That consists in temporarily lessening the amount of blood in the head and upper parts of the patient by cording one or both thighs to accumulate quarts of blood within the vessels of the lower limbs.

I would not have missed Dr. Bodine's discussion. It seemed to me to cover the whole field superbly.

Dr. H. J. Kauffer—In going over the literature on trigeminal neuralgia, we find the opinions most conflicting. In pathological changes of the peripheral nerves, Dana found an obliterating endarteritis, but no change in the nerve element. Putnam in ten cases found a most frequent pathological change, an endarteritis and a general fibrosis. Krause, however, finds only occasional thickening of the nerve sheath and nothing else. Pathological changes in the ganglion. Rose reports finding a

thickening of the interstitial connective tissue and an irregularity in form of the ganglionic cells. He regards the disease as a chronic inflammatory process, resulting in contraction and compression of the nerve cells. Harsley has not seen more degenerative change than could be accounted for by the age, condition, and habits of the patient. Krause on examining a number of cases found no sclerosis or endarteritis, but only a degeneration of the ganglionic cells and nerve fibres; he believes, as many others, that the origin of the disease is in the ganglion.

If the origin of the disease is within the ganglion, why will a peripheral operation sometimes give relief? Why should its occurrence in the opthalmic division be so rare? Is it not reasonable to assume that if the origin of the disease is in the sensory root of the fifth nerve that all three of its branches would be equally involved?

The operation for the extirpation of the ganglion is attended with a very high rate of mortality. Tiffany from a collection of 108 cases, places the mortality at twenty-two per cent., or more than one in every five. Tark puts the death rate at seventeen per cent.

Dr. Bodine tells us to-night that he has only a mortality of four per cent.; if his modification of this operation has reduced the death rate he is certainly to be congratulated, but I do not believe this to be so; I believe the reason for Dr. Bodine's findings is entirely due to his superb technique. I have known Dr. Bodine for some years, and can safely say without fear of criticism that his surgical skill is equaled by few.

It seems to me that with the conflicting opinions of the pathological changes in the nerve, that where no pathological change was found within the nerve or ganglion, the cause of the disease was not within the nerve or ganglion, and that where a pathological change existed the case was one of long standing. I believe that in probably more than ninety per cent. of these cases, the primary lesion is of an inflammatory nature within the tissue supplied by the fifth nerve, and not in the nerve itself, and I also believe that in by far the greatest number of these cases the primary lesion is within the dental zone. It behooves us as dentists, when a case of this class presents itself, to be able

to detect any dental abnormality which may present. If the initial lesion is of dental origin, one can always effect a cure by removing the cause, providing the diagnosis is made early in the history of the disease.

Dr. Shields says that by extirpating the dental pulps he has given relief. This must be true, provided the focus is here and not of long standing. In the radiograph which he passed around, the focus in this case is clearly the impacted third molar, and the reason for recurrence is that the cause of the tic douloureux—the impacted molar, lies distal to the field of his operation. Dr. Shields has in this case performed a Perthes operation—that is, he did a neurotomy close to the foramen and plugged up the foramen to prevent future nerve connection through regeneration of nerve; this would have effected a cure had the lesion been in the peripheral branches outside of the foramen.

The patient which Dr. Bodine presented to-night is certainly a testimonial to his surgical dexterity. I am glad to hear him place stress on the seriousness of the operation, and say that he only performs it when all other methods of giving relief have failed. He emphasizes the necessity of a careful examination.

In closing I repeat that if the dentist makes this examination, I believe in seventy-five per cent. of these cases one would find a dental lesion which is causing the disease.

Dr. M. I. Schamberg—This paper is of importance to the medical profession, of importance to the dental profession, and of greater importance to the public. The idea that has prevailed that many conditions about the mouth may be looked upon lightly because they are not giving great pain, or are not distressing the patient greatly, is a fallacy. I know of no more important part of the human economy than the mouth, in that it has such an intricate supply of nerves, and tends to set up disturbances more far-reaching than the local disease would indicate. I speak of this for the reason that the essayist in alluding to the subject of facial neuralgia, has endeavored to differentiate between the various forms. He has endeavored to point out that many cases of pronounced tic douloureux are cases that have started by some slight irritation about the mouth. I want to go a little farther than he has, in referring to the pulps of teeth, or impacted teeth,

and refer to pericemental irritations that I have found clinically to be the cause of many cases of early facial neuralgia, before there has been structural change within the nerve trunk. I think every case will go on to an ascending degeneration or influence upon the nerve.

Dr. Kauffer has referred to the many findings in the ganglia; but there is unquestionably a change brought about by prolonged irritation. If we were to examine the mouths of the majority of patients coming to us, we would find many lesions in mouths that are ordinarily considered healthy, and in mouths that are "finished," so to speak. Patients are sent away, and told their mouths are in perfect condition. The average case that presents itself for a radiograph in a case of tic douloureux, or facial neuralgia of any of the divisions of the fifth nerve, will usually show so many abnormal things, that you do not know which you should point to as the cause. There is great need for the large radiograph, to be helped with many small ones.

I want to refer to the work of Vida Latham, of Chicago, in her study of the dental pulp. She has found many degenerative things going on. She has even shown epithelioma of the pulp. She has shown abscesses in a vital pulp. Our clinical study of these cases is not sufficient. I have seen cases, as referred to by Dr. Shields, that were absolutely cured by locating and eradicating some lesion connected with the teeth, often involving the bone as a result of acute disturbance.

I do not agree with Dr. Bodine in that very point. He says he doubts whether Dr. Shields's case is cured. I am inclined to think it is. I know why Dr. Bodine took that exception, and it is because he has probably seen many cases, as I and others who have studied this condition have, where patients have had tooth after tooth removed, and after the removal of each tooth they have experienced relief. It is really the experience of blood letting, so to speak, and even the removal of the pulp will give that relief.

The unfortunate part of it is, we can never say which cases are absolutely cured, when a local cause is removed.

The only point of great importance is the need for determining early, a possible cause for the facial pain, and leaving no stone

unturned to remove it. I believe that no operation that is short of removing the Gasserian ganglion is entirely satisfactory in these cases—that is, the sensory root of the Gasserian ganglion. All the others only temporize. Patients get relief with the alcohol injections when they are perfectly performed, and, if they are imperfectly performed, they do not. It is our duty to be very careful in the early stages of facial pain to leave nothing undone in eradicating the cause of peripheral irritation. There is no part of the body that is so subject to neuralgia as the face—not only facial neuralgia, but in setting up neuritis in other parts by septic absorption. I want to speak also of the effect of that in the various forms of anæmia, and the ultimate result on the nerve supply.

I believe the papers presented to-night are of great importance, in that they both teach the importance of very careful diagnostic study of the patient's condition. There are many forms of gingivitis, and each may present a different type. A patient was presented at the hospital on Saturday with a condition of gingivitis that was acute in its onset. I am having a Wasserman test made, and we will have a blood count made to discover the possible influence of anæmia.

I was called to see a lymphatic leucemia some time ago in Boston, where the case was pronounced one of noma, or gangrenous stomatitis. These conditions are frequently found about the mouth, and we must go to the bottom. I do not believe in the cases Dr. Vaughan referred to, that they were entirely local infections. They were made possible by systemic trouble.

There are Vincent's bacteria in many mouths, but they will not propagate or attack the individual, because there is resistance to them. The same as pneumococci or other bacilli do not attack the individual, because of the resistance, so we find it in these cases, and there is usually an underlying systemic condition that invites the trouble.

Dr. Shields—To Dr. Bodine's inquiry as to why, when the nerve was resected nearer the ganglion, it did not cure, but only relieved for a few years—why it was possible to relieve it through the peripheral termination within the teeth—the answer is simply because the lesions within the teeth were the initial cause of

the neuralgia, and as soon as the least fiber from the main trunk connects with the peripheral branch terminating within the teeth, the pain returned; but when the lesions are removed from the teeth, as described, and the main branches allowed to remain undisturbed, the pain will not return.

Dr. Bodine in his able discussion placed our profession where we belong, when he said: "In the past when a physician failed to cure, the case was placed in the care of a general surgeon, but in the future before he will either inject alcohol or resect, he will refer the case to a dentist skilled in the work before taking charge himself." I thank you, gentlemen, for your discussion.

Discussion of Dr. Vaughan's Paper.

Dr. Nodine—Is this ulceration a continuous ulceration, or are there healthy spaces between them?

Dr. Vaughan—They may be continuous.

Dr. Nodine—The reason I ask that is, because it has been described as a section ulceration, but not a continuous ulceration. Some writers recommend methylin blue and violet, and some have recommended salvarsan for use in these cases. Has the doctor had any experience with any of these three?

Dr. Vaughan—No, I have not.

Dr. Wm. J. Lederer—Mr. President and gentlemen, with your kind permission I would like to say a few words about the use of salvarsan in the treatment of Vincent's angina. It appears that salvarsan will not only destroy the *spirochetæ pallida* of syphilis, but that it has a selective bactericidal action upon all types of spirilla. Koch and Flu used this drug in spirochetic disease other than syphilis, as in frambesia in spirilosis in fowl, etc.; Gerber, Rumpel, and Plaut, all Germans, were the first to employ salvarsan in buccal lesions, and Julian Zilz, an Austrian observer, first employed salvarsan in dental and maxillary disease. He published an interesting report of his work, and, upon reading this, I obtained salvarsan, and used it in the treatment of two cases of Vincent's angina with brilliant results.

W. D. Miller years ago demonstrated the presence of the *spirochetæ dentium* in marginal gingivitis; some years later he

found this organism in pulp abscesses in sound teeth, showing that this type of spirillum is an anærobic organism.

Zilz at the present time is using salvarsan for the treatment of pyorrhea, alveolar abscesses, and even suggests its use for the devitalization of teeth. I tried it for the latter purpose at my clinic, but must report failure. I believe, however, that salvarsan may prove not only valuable to the physician, but also to the mouth specialist.

Vincent's angina can only be diagnosed with certainty by the microscope, and I am delighted to see that the dentist is beginning to use this instrument.

We are gradually returning to Mother Medicine, from whom we have been drifting away. The excellent work done by men like Dr. Vaughan and Dr. Schamberg is only possible by the application of medical and surgical principles to dentistry.

Dr. R. H. M. Dawbarn—I would not have missed this paper of Dr. Vaughan's for anything. In most respects, the illustrations made were very clear and illuminative; but those showing the microbes mixed with others in an indiscriminate mass are a long way from satisfactory.

Vincent's microbes are to be found one each in a single epithelial cell—that is, always a single spirillum and a single rather thick fusiform microbe.

Dr. Vaughan used the term "symbiosis." Perhaps not all of you noticed the term, which really means the *marriage of microbes*. Of this, Vincent's angina is the most striking known example. We do not know which is husband and which is wife—which is male or which female. But it seems to be a strictly moral arrangement, for invariably one spirillum and the fusiform microbe live together, and neither more nor less of either kind.

As to the chemical part of this thing, the professor of pathology at the Polyclinic Medical School, has taught for years that a drug, which is especially indicated, and which is sure to cure, if continued, is the chlorate of potash, in as strong a solution as can be used without its being an irritant.

Those of us who have seen much of Vincent's disease have noticed—and it stands to reason—that these pockets, as described

by Dr. Vaughan and shown by the lantern to-night, when present in the upper jaw, heal much more readily than in the lower jaw. Why? It is self-evident! Neither the discharge from these pockets, nor any others, will drain uphill with any thoroughness, and as long as you permit it to exist as a pocket, it will be obstinate in its response to treatment. I invariably, in the lower jaw, split each pocket at once, to its bottom, for good drainage; and am satisfied that is a very essential point in the treatment.

Dr. Wm. J. Lederer—In justice to Dr. Vaughan, I wish to say to Dr. Dawbarn that this slide, which Dr. Vaughan has shown, is not a micro-photograph, but a reproduction of a drawing which I made at the microscope some years ago; at that time there existed no picture of the organisms of Vincent's angina in any text-book. It must also be borne in mind that a slide of this kind thrown upon the screen does not show up as well as the original drawing.

Speaking of the dental uses of salvarsan, it may frighten some of the men, as no doubt they are thinking of injections. Salvarsan for buccal use is employed locally, and the best way to use it is as a ten per cent. suspension in either glycerin or oil. I employ a ten per cent. suspension in sesame oil—using iodipin as the suspension medium.

FREDERICK C. KEMPLE, D.D.S.,
Editor First District Dental Society S. N. Y.

BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION

December 11, 1912.

The second meeting for the season, 1912-1913, of the Boston and Tufts Dental Alumni Association was held at the Hotel Lenox, Wednesday evening, December 11, 1912. President Arnold called the business meeting to order at 6.30, when various matters were taken up. Among other things, a motion was carried to appoint a committee of three to wait upon the president or faculty of Tufts College in regard to the appointment of a new dean. It was urged that such a man should be a dentist, and the committee appointed was instructed to forward this plan. Two new members were elected.

The speaker of the evening was Hon. S. J. Elder, of Winchester. In this regard the Executive Committee felt they had secured a man to whom all could listen with delight and appreciation, and certainly this was what proved the case. For nearly two hours everyone was entertained with a flow of wit and reminiscence which apparently was inexhaustible. The subject was "People I Have Met." Mr. Elder has met and talked with many a notable person during his life. He also told of one whom he "nearly met," saying that during the Civil War he was in Washington with his uncle, and they went to the Capitol to meet Mr. Lincoln. After waiting in the reception room for nearly two hours, word was sent out that the President would see no visitors that day. This, as Mr. Elder told in his most sympathetic manner, was not to be wondered at, as the streets of Washington were filled with wounded soldiers from the Battle of Cold Harbor and the terrible fighting of the Wilderness. Naturally, it was a great disappointment to him. Then followed in rapid succession word pictures of Wendell Phillips, B. F. Butler, and Henry Ward Beecher. These were only a few of the many who were touched upon. Life at Yale from which Mr. Elder graduated in 1873 was described.

The arbitration treaty at The Hague was next taken up. Mr. Elder was one of the members from the United States which debated "The Fisheries Dispute," the result of which was so satisfactory to this country. This in itself was of tremendous in-

terest, as told by one who had actually debated the various questions. He also portrayed the members of the court and the manner in which the business was conducted.

A hearty vote of thanks was given Mr. Elder, and all felt that the time had been spent most profitably.

A. G. RICHBURG, D.M.D.,

Editor, Boston and Tufts Dental Alumni Association.

THE BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION

FEBRUARY 12, 1913.

The third meeting of the series for 1912-13 of the Boston and Tufts Dental Alumni Association was held at Hotel Lenox, Boston, Wednesday evening, February 12. The largest attendance for a regular meeting, that has been held for several years, was the result of the notice sent out by the Executive Committee.

The speaker of the evening was Dr. Henry A. Baker, of Boston, than whom there is no better example of a practical, up-to-date dentist, in all New England. Dr. Baker has brought out a number of useful and practical devices for use in his chosen field. His cleft palate appliance is well known. Of late years Dr. Baker has specialized in cleft palate work and orthodontia.

The topic for the evening, "Impression Taking and Model Making for the General Practitioner," was handled with unusual skill and ability, which, together with the large number of models illustrating the various phases of the topic, gave a well-rounded and complete exposition of the subject.

Several cases shown were perhaps of special interest, such as the cleft palate and partial plate cases and malformation cases. The general high degree of workmanship and finish of the models, was quite generally commented upon.

The business meeting, held before dinner was served, was of great interest, and brought out many new facts in regard to the dental nurse bill. The arguments in regard to the resolution of Dr. Retten and the queries of Dr. Belyea, were of value in clearing up many points in the proposed legislation.

The paper was discussed by Dr. Frank A. Delabarre.

Plans were talked of and progress reported in the preparation for the reception of the senior class at the Tufts Dental School. This meeting will be more fully described later.

The committee, elected to wait upon the Faculty in regard to a dental dean, was increased to ten members, and its previous activities were reported upon.

The remarks of "the grand old man of dentistry," Dr. Andrews, of Cambridge, were of great interest and shed new light upon the dental dean situation. Adjournment was at a late hour.

ALFRED G. RICHBURG, D.M.D.

Editor B. and T. D. A. A.

NOTE: ACKNOWLEDGMENT TO DR. RHEIN.

Through an oversight, credit was not given Dr. M. L. Rhein for a number of radiographs which illustrated Dr. Levy's article in our December number. The Editor regrets this omission, and hastens to thank Dr. Rhein for these valuable pictures.

THE JOURNAL OF THE ALLIED DENTAL SOCIETIES

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No. 1

EDITORIAL DEPARTMENT

THE DENTAL NURSE QUESTION

The Dental Nurse Bill, printed elsewhere in this number,¹ now before the Massachusetts Legislature, will have its hearing early in this month. Its fate is being watched anxiously by its friends and enemies—after months of warm and sometimes bitter debate. The increasingly apparent need of widening the scope of dental service—especially for children in our public

¹ See p. 79.

institutions—is forcing this question of the feasibility of the nurse trained to cleanse teeth, in accordance with approved methods, and under proper supervision. This question is important, of course, in all crowded communities, but it seems natural to look to the Bay State for the real throes of pioneer work. The Nurse has already arrived in Connecticut and has gone quietly about her work. We have not heard as yet of serious adverse consequences following her advent, about five years ago, but it may be rather early to report in this regard, where comparatively few licenses have been issued to date.

The arguments pro and con—but especially pro—in recent literature have been voluminous. The radical and progressive element in this controversy have dealt roundly with the more cautious and, perhaps, older members of the profession, who fear the “letting down of the bars” in dental practice. The conservatives, however, defeated the bill last year, and may do likewise with the one now pending. The result last year was the framing of a better bill; and should the present one meet defeat, it is highly probable that further improvements will insure its passage in the near future.

From the mass of evidence presented, it would seem that the trained dental nurse is soon to become a public necessity. It behooves us calmly to prepare to meet this new responsibility and opportunity. While mere oral cleanliness in its ordinary sense may not be the whole story of the prevention of dental caries, it is our

chief weapon at the present time in combatting this world-spread disease.

We must guard our patients and the great public from charlatanism and incompetencè by limiting and defining the work of the nurse, and then should welcome this means of carrying prophylactic service to the thousands who now suffer in neglect. This safeguarding of the public should be possible of accomplishment through proper laws and *especially* by instituting a regular training course, comparable to that which the general medical nurse must undergo, adapted to the special dental needs. We would suggest further that a neat uniform should be required, which would soon become known as the insignia of her office. This would deter the unlicensed would-be nurse, and command respect for the person regularly qualified by law.

DENTAL APPOINTMENTS BY THE DEPARTMENT OF HEALTH

The appointment of dentists by the New York Health Department, to serve on fixed salaries in properly equipped public clinics, is a good beginning in the tremendous work of organizing dental service for the poor of a great city. The problem is of almost overwhelming magnitude, from the present outlook, but it is gratifying to note the growing willingness and desire on the part of the authorities to co-operate with the dental profession in advancing oral hygiene.

Following the recent recommendation of Com-

missioner Lederle, twelve dentists have been appointed and four or five clinics established. We are largely indebted for this important action to the consistent efforts of Dr. Herbert L. Wheeler, who has worked vigorously for many years in the establishment of dental clinics in this city. We have Dr. Wheeler's authority for the particulars concerning the appointments mentioned:

" They (the twelve appointees) are apportioned as follows: Ten in the Division of Child Hygiene. These are the ones that are to man the clinics, which clinics are provided for school children under fourteen years of age, who are very poor. Eleven of these receive \$1,200 per year, and one who has charge of the service receives \$1,500 a year. Great care has been exercised in choosing young men, and the efficiency and usefulness of the service bids fair to be exceedingly high. The other two dentists are attached to the Division of Communicable Diseases. One spends one day a week at the Otisville Preventorium and receives \$400 a year. The other one examines the mouths of all patients who apply at the Tuberculosis Clinic for treatment by the city, and has power to order any necessary work done, either operative or prosthetic, that is needed to bring the masticatory apparatus of the patient up to a proper standard, and to see that the mouth is put in a condition where it will not be a menace, by being a source of infection. His salary is also \$1,200 a year.

" * * * I feel that the Dental Profession and the public are entitled to congratulation. Not only do the people of New York owe a debt of gratitude to Doctor Lederle, they also are indebted to Mayor Gaynor, the Board of Estimate and Apportionment, and the Board of Aldermen, besides other officials of the Board of Health."

This is concrete, important work. We congratulate ourselves, the public and the municipal authorities upon this somewhat tardy awakening.

REVERSAL OF THE TAGGART DECISION

As we go to press information is received through *The Washington Law Reporter* that the appeal of George W. Boynton versus William H. Taggart "from a decree of the Supreme Court of the District of Columbia, in Equity, No. 27,927, enjoining the infringement of a patent," has resulted in the reversal of that decree by the Court of Appeals.

This refers to letters patent numbered 872,978, granted William H. Taggart December 3, 1907, on "a new and useful improvement in methods for making molds for dental inlays and the like." The evidence showing prior use of the "Lost Wax" method of forming a mold for casting metals, is reviewed in detail, and Mr. Justice Robb, in delivering the opinion of the Court, concludes as follows:

"We are fully persuaded that the evidence shows beyond a reasonable doubt that for many years prior to the filing of the original application herein, the process of making patterns and molds for dental inlays and the like, as expressed in these claims, had been publicly practised upon many occasions. This finding avoids the patent and renders it unnecessary to determine whether the claims thereof were anticipated by the prior record act.

"It follows that the decree must be reversed, with costs, and the cause remanded with directions to dismiss the bill."

NOTES ON PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S., NEW YORK CITY

Gold and Tin Foils.—The various combinations of gold and tin foils are valuable for the saving of tooth structure and they could be used more frequently with advantage.

If a sheet of non-cohesive No. 4 gold foil be torn into strips and each strip rolled with a strip of No. 4 tin foil one-fifth as wide, either in a napkin or foil roller, a rope results which can be cut into lengths as desired.

This combination, one part tin to five parts gold, is of great value as a filling material in the crowns of deciduous molars, as well as in crown cavities of bicuspid and permanent molars, when the quality of tooth substance, or the condition of the environment, makes the use of gold alone inadvisable.

This material can be introduced rapidly, and when necessary, in cavities impossible to keep dry.

The methods of packing should be those used in the manipulation of soft gold, the plugger carrying the middle of each piece of rope to the floor of the cavity, after which the ends are turned in and keyed into the mass with the absolute point.

In most approximate cavities other materials can be used more accurately and rapidly.—S. E. DAVENPORT.

Uses of Cocain-Adrenalin.—To control bleeding and reduce pain during operations in which the gum may be involved, use the Parke-Davis Company's Hypodermatic Tablet, No. 151, which contains cocain and adrenalin. These tablets are provided in the form of small cylinders, and with a sharp lance may be cut into quarters or fifths and kept in a small shallow box ready for instant use.

In preparing a root for a crown pack the mouth with cotton rolls, dry the adjacent tissues. Place a small piece of the tablet directly on the gum margin labially and another piece lingually, and with a half drop of water in the points of the tweezers dissolve the medicament and smear it around where wanted. In less than five minutes the gum will be blanched and quite insensi-

ble to the work necessary in grinding down the root and fitting a band. The freedom from pain is appreciated by the patient, and the absence of bleeding facilitates the work of the operator in a large degree.

This same tablet cut in fifths is used for the removal of vital pulps. After exposure is obtained, a drop of sterile water is conveyed to the bottom of the cavity with the points of the tweezers, and the small piece of cocain-adrenalin tablet placed in contact with it. The resulting solution is right where the operator wants it to be and is readily absorbed by the pulp tissue when slight pressure is applied.

In working upon cervical cavities, which are often very troublesome, the bleeding and pain in the gum can be very much reduced by the use of these tablets, and many other uses will suggest themselves to the mind of the operator as the necessity arises.—W. D. T.

Precautions in Analgesia Technique.—In operating under analgesia many things enter to bring about success or failure. The patient is in a state where he is very susceptible to suggestion of any kind, and all things that tend to excite a normal individual before or during an operation will excite the analgesicised individual to a much greater extent. Therefore all noise should be eliminated from the operating room. There should be no loud talking, no rattling display of glittering instruments. There should be no blundering in the technique of the operation. A rough or unskilled operator will have but moderate success with analgesia.—ARTHUR E. GUEDEL, in *Oral Hygiene*.

Hemorrhage Following Extraction.—The extractor must know what to do when given a history of predisposition to hemorrhage, in order that when he extracts he may feel assured that everything has been done that could have been done. In these cases extraction should be avoided if possible; but if the removal of the tooth be absolutely necessary, we must proceed with a prophylactic method of treatment for about seven days prior to the operation.

This should consist of the administration of calcium lactate in doses of 10 to 15 grains. The operation should be performed

in the morning, thus giving the whole day for treatment should hemorrhage occur, the wound to be immediately plugged as a preventive, coupled with the administration of some hemostatic such as the continuance of the lactate, for it is obviously easier to prevent hemorrhage occurring than to arrest it when once it has commenced. The subsequent treatment consists in the continuance of a hemostatic.—W. A. S. HILLS, *Dental Record*.

Melotte's Metal Dies.—In pouring dies of Melotte's metal, the metal is often either too hot or too cold, or the bismuth has been burned from the metal, all these factors producing imperfections in the dies. In order to obtain a sharp die, the metal should be poured into a rubber ring, and just before it hardens pressed upon firmly with a glass pestle of about the size of the rubber ring. A die made in this way will be smooth and free from bubbles.—L. C. HOLLAND, *Dental Summary*.

Influence of the Tongue on Respiration.—In normal people with normal arches the tongue fills the whole mouth and extends back into the oro-pharynx almost to the post-pharyngeal wall, against which the soft palate and epiglottis slightly rest. Interfere with the tongue by compressing it between narrow dental arches and you will see that it is forced in the direction of least resistance, which is back in the oro-pharynx. This pushes up the soft palate against the post-pharyngeal wall, cutting off respiration through the nose and blocking the drainage and ventilation of the same. As the tongue forces the epiglottis downward and back it also interferes with oral respiration, which, however, is a little easier than nasal respiration under these circumstances; hence, "mouth breathing." Now, when the dentist spreads these narrow arches it gives more room for the tongue, which moves forward, taking its normal position, and in turn releases the pressure upon the soft palate and other structures, thus permitting nasal respiration, thorough ventilation and drainage, all of which conduces to an improved condition of the general health.—MATHEW H. CRYER, *Items of Interest*.

After Treatment of Abscessed Teeth.—The treatment of abscessed teeth after extraction is a point to which I particularly desire to call your attention. The tooth socket should be thoroughly irrigated with a non-irritating solution, after hav-

ing used a curette and scraped the abscess cavity in order to remove any pyrogenic membrane or débris which might remain after the extraction. The socket having been thus cleansed, it should be lightly packed with iodoform gauze, 5%, and the dressing renewed and socket irrigated with an antiseptic solution in from twenty-four to forty-eight hours, and as often thereafter as may be necessary, according to the severity of the infection from the abscess.—JAMES F. HASBROUCK, in *Items of Interest*.

Cleansing Root Canal Broaches.—Root canal broaches are first immersed in boiling water for about ten minutes, after which any débris caught in the barbs can be removed by a stiff hand brush and water. They are then boiled again, and finally transferred to glass-stoppered bottles containing alcohol.—K. PAUL CARSON, *Dental Cosmos*.

Root Canal Filling.—The following mixture is recommended for filling root-canals: Creasote, from one to four drops; trioxymethylene, 0.02 gm.; zinc oxide, enough to make a stiff paste. This paste is claimed to be more suitable than one containing liquid formol, the trioxymethylene apparently retaining its power to generate formaldehyd indefinitely. Care must be taken not to employ an excessive quantity of the trioxymethylene, as the formaldehyd might produce a pericementitis.—C. BOURGEOIS, *Revue Odontologique*.

Maxillary Osteomyelitis.—Osteomyelitis of the jaw is differentiated from the simpler infections and forms of necrosis by the following symptoms: Extensive involvement of the contents of the inferior dental canal, tendency to the widespread secondary destruction of the bone, and damage done to many or all of the lower teeth. Osteomyelitis in the young occurs in the lower jaw as well as in the long bones of the extremities, although at a somewhat later age. Its early diagnosis is to be based upon the early severe systemic disturbances and the widespread involvement of the bone.

The prophylactic treatment consists in drilling the bone under aseptic precautions. After the formation of pus, free drainage should be employed, which should be external if there be much necrosis. No teeth should be extracted, nor should teeth which merely hang from attached mucous membrane be re-

moved. Dead portions of bone should not be removed until entirely detached or until new bone capable of maintaining the contour of the jaw is formed. Separated and loosened teeth with gum attachment usually become reimbedded and serviceable.—W. WAYNE BABCOCK, *Journal American Medical Association*.

Hints for Avoidance of Sepsis of Dental Origin.—Dentists should realize the seriousness of the most frequent operation they perform, namely, that of devitalizing and extracting pulps, since infection and serious bone destruction may originate from this cause.

Destruction of the bony floor of the antrum does not necessarily mean perforation of the membranous floor, or infection.

An alveolar fistula leading into a cavity where a considerable portion of the tooth is exposed requires extraction of the tooth before complete recovery can be expected.

Persistent headaches and general reduction in health are frequently caused by very insidious alveolar abscesses.

In destruction of the mandible, requiring removal of bone, it is advisable to establish drainage through the chin, and approximate the gingival margins with sutures so as to shut off a pus cavity from the oral cavity.

Naso-oral fistulæ may be closed by a membranous flap from the roof of the mouth.

In all suppurative conditions of the mouth, tincture of iodine, U. S. P., should be used as a disinfectant.

Blood clot organization is typified in the repair of the maxillary process after the extraction of teeth. Here, we may extract many teeth, leaving holes of considerable size, which are immediately filled in with blood, and even the patient never hears of it again. Why not larger cavities? The practice of packing sterile cavities with gauze at every dressing is wrong, since it breaks down and destroys blood clots and valuable plastic material thrown out by nature to rebuild damaged tissues.

Extensive areas of bone may be stripped of the periosteum, and, if sterilized and adjusted to the original position, will reappear and revitalize the bone and necrosis will not result.—S. L. McCURDY, *Dental Summary*.

BOOK REVIEWS

By C. FRANKLIN MACDONALD, D.M.D.

A TEXT-BOOK OF DENTAL PATHOLOGY AND THERAPEUTICS. For Students and Practitioners. Based upon the original of the late Henry H. Burchard, M.D., D.D.S. Rewritten by Otto E. Inglis, D.D.S., Professor of Dental Pathology and Therapeutics in the Philadelphia Dental College, Philadelphia. New (fourth) edition, thoroughly revised. Octavo, 768 pages, with 671 engravings and a colored plate. Cloth, \$5, net. Lea & Febiger, Philadelphia and New York, 1912.

Books of value are most generally known by their popularity, and the new fourth edition of this Dental Pathology and Therapeutics exemplifies this rule. Dr. Inglis, utilizing Dr. Burchard's work as foundation, has evolved a very creditable text-book of Dental Pathology; and further, it is to be noted, has kept well within the bounds of the title.

Since dental pathology is merely a branch of general pathology, the first section is devoted to a concise yet comprehensive presentation of general pathology sufficient for the dental student's requirements, taking up the bacteriology, general and local causes of disease processes, and the various disturbances of nutrition, etc., which influence these conditions.

The second section deals with embryology, anatomy, and histology, but directed strictly to the dental aspects of these subjects. A very interesting dietary for infants relative to the important age of teething is considered in this section. That in the resorption of the roots of temporary teeth "the solvent is acid," is hardly supported by the evidence and seems open to grave criticism. This opinion might better have been expressed primarily as a theory.

Affections of the enamel and dentin are considered in the third section, and deals mainly with dental caries, its causes, symptoms and the various treatments both immediate and preventive. The action of "ptyalin" upon "maltose," changing it to glucose, is not the present conception of the action of this enzyme, since another, *maltase*, is now considered to be present

in the saliva and to perform this particular change. Likewise, in the first section, organized and unorganized ferments have given way to organized ferments and their products enzymes, or, in some minds, simply enzymes.

In the handling of hypersensitive dentin, all methods, excepting local injection for producing conduction or infiltration anesthesia, are given. The apparent successes attending this method should make it worthy of mention.

Section four takes up the diseases of the dental pulp and enters extensively into the details of the pathology, symptoms and methods of treatment of these important conditions. Removal of pulps by anesthesia of apical tissue under cocain is very briefly considered, but no mention is made of substituting novocain, which is now generally conceded to be the superior, for cocain. In fact, novocain-suprarenin is not given place as an anesthetic in this book. In the treatment of tortuous and minute canals, good advice is given for conservatism of treatment in not attempting to force findings of such canals since the "danger of perforation is the greater evil."

Diseases of the pericementum and their relations to pulp diseases and means of differentiation are considered in section five in a very complete manner.

Section six, a continuation of the previous section, deals with pericemental diseases beginning at the gum margin, and closes with short concise articles upon miscellaneous infections of the mouth. Gingivitis is first considered in detail, and pyorrhea alveolaris is designated as a certain distinct phase of this pathological condition. This distinction is logical and well taken since the term pyorrhea alveolaris has been previously used without thought of word value, made to cover numerous different conditions and has led to considerable confusion. Local and systemic treatments for these conditions are generally fully considered.

Prescriptions and suggestions for medicinal treatment are scattered throughout the book, and many valuable illustrations elaborate the text.

This work of dental pathology is, in the main, most modern and complete and yet conservative in its treatment of the va-

rious subjects. As a text-book for students, it could hardly be improved, and should be for the practitioner a valuable book of reference.

CHEMISTRY FOR DENTAL STUDENTS, BEING LECTURE NOTES ON CHEMISTRY FOR DENTAL STUDENTS, by H. Carlton Smith, Ph.G., Lecturer on Physiological and Dental Chemistry at Harvard University Dental School. Second edition revised and enlarged. 403 pages. Cloth, \$2.50, net. John Wiley & Sons, New York, 1912.

After six years comes the second edition of this dental chemistry by H. Carlton Smith, a work which is quite unique and different from other books upon chemistry, which the dental student has had presented for his consideration. Its title, "Lecture Notes," distinguishes it at once as not pretending to be an elaborate *text-book of chemistry*, but the author has aimed to pick out from that vast bulk of chemical material those portions that are of particular interest and value to the dentist.

From the chemist's standpoint, it may be criticised as too incomplete and superficial, but when one considers that dentists are not to be made chemists and that the present state of dental curriculums and preliminary education necessitates but a brief, yet particular, knowledge of certain branches of chemistry—this book should be found of assistance in attaining these ends for the dental student.

Assuming something of a preliminary laboratory training in general chemistry, the author, after a brief introduction made up of concise explanations of terms used in general chemistry, enters upon qualitative analysis. Under each group the individual metals are taken up with their occurrence, selected compounds and facts of general and particular interest. Much has been added in these respects over the last edition. Labeled cuts, illustrating positions of precipitates and filtrates, make the processes of analysis most clear. A few selected questions follow at the end of each group. These questions might have been continued throughout the book to good advantage.

Part II contains six short chapters dealing with dental metallurgy, in which alloys, amalgams, solders and cements are considered in sufficient detail.

Part III takes up volumetric analysis, which is made as concise as possible, giving a brief idea of this big subject, and dealing primarily with those determinations of importance to the dentist.

The fourth section presents micro-chemical analysis with a few preliminary exercises preparatory to the chapters upon "Local Anesthetics" and "Teeth and Tartar." "Local Anesthetics" is rather a misleading and unsatisfactory title as compounds such as saccharin, mercuric chlorides, glycerol, gutta-percha, etc., are included.

Organic chemistry, under Part V, does not pretend to be exhaustive, but concise; yet it is elaborate enough to give the student sufficient general knowledge of this vast subject for future study in the field of physiological chemistry.

Part VI is devoted to physiological chemistry, and it confines itself to the best recognized facts and theories, and contains experiments calculated to demonstrate and impress these facts upon the student.

Under the general title of Digestion, Part VII begins with the subject of saliva. Saliva is here considered in more detail, and given more prominence than any other chemistry affords; in fact, it is probably the most complete and modern presentation of the subject that can be found in any text-book. The analysis of saliva is quite complete in the light of present knowledge, and though new findings of importance will continually come forth, this chapter should furnish an excellent basis for study in this matter for some time to come. Gastric and pancreatic digestion and bile are briefly presented with selected laboratory experiments. The feces have not been considered, and as recent data seems to point to a relation between the starch present in the feces and the presence of occluding teeth, a few paragraphs on this subject might have proved of interest and value.

The last section takes up urine at considerable length, mainly relative to the analysis. The final few pages discuss the "interpretation of results," and the author has compared urine and salivary analysis from the standpoint, "of general metabolism rather than with a view to differentiate various forms of renal disease."

An appendix contains the methods for preparation of many reagents and compounds which are used throughout the book.

This book of 403 pages contains in a concise manner much valuable information, which bears directly or indirectly upon the subject of dentistry. It should not only be of value to teachers of dental chemistry, but also, in correlation with lectures, should prove an unequaled book for the student.

AN INTRODUCTION TO DENTAL ANATOMY AND PHYSIOLOGY, DESCRIPTIVE AND APPLIED. By Arthur Hopewell-Smith, L.R.C.P., London; M.R.C.S., England; L.D.S., England; Prizeman of the Royal College of Surgeons of England, Lecturer on Dental Anatomy and Physiology, Dental Surgeon, and Demonstrator of Practical Dental Histology at the Royal Dental Hospital of London; Member of the Faculty of Medicine of the University of London; etc. Large octavo, 372 pages, with 340 new and original illustrations, including a frontispiece in photogravure and five plates. Cloth, \$4, net. Lea & Febiger, Publishers, Philadelphia and New York, 1913.

Dental anatomy, it is admitted, is a difficult subject for which to create enthusiasm, and one in which few can be made to interest themselves. Dr. Hopewell-Smith in his new work has undertaken to overcome the difficulties and to present the subject in a way which will hold the attention of the reader, possibly stimulate a permanent interest in the subject, and at least demonstrate to the dentist, and others, that there is far more in the study of dental anatomy and physiology than they have heretofore thought.

To attain this end, the author has delved into the fields of comparative anatomy and of evolution, has introduced the reader "to a new and even romantic field of natural history," and has tried to tell a fascinating story embodying the dry, stern facts of anatomy.

That he has done well all who read this book will undoubtedly admit.

Some of the fascinating and "romantic fields," as presented, may not accord with the ideas of some readers and the advisability of departing from the strict field of anatomy, devoid as it

may be of pleasure, to enter the realms of uncertain theory, realms intimately connected with philosophy, may be questioned. The author's explanation of "what is life" and "what is death" may prove quite unsatisfactory and inconclusive, and many have a repugnance—well founded—to the idea of "our simian forefathers." Of Darwinism and the modern theories of evolution, the author gives only one point of view. Such sketchy and incomplete presentations of these theories in a work of this kind, while possibly adding romance to the subject, may do damage in other quarters since the general mind to-day is prone to materialism. Many people have only a hazy and vague conception of evolution, heredity, etc., and their tendency is to misunderstand and misinterpret.

However, the author has brought together many valuable and interesting facts and has presented them in a delightful manner.

After a number of preliminary chapters dealing with the comparison of teeth of man and animals as to their number, functions, morphology, etc., and including the theories of evolution, the anatomy of the teeth of man is considered. Most complete is this long chapter descriptive of the individual teeth and a rather new addition is that of "surgical anatomy," which is really just as logical and necessary for the teeth as for other parts of the body. No mention is made of the "temperamental types."

The relationships of the teeth to the osseous, nervous, vascular and lymphatic systems is considered, and this is followed by a short resumé of the anatomy of the bone and soft tissues of the mouth.

The development of the jaws and teeth takes up the theories of ossification and the various changes which go on during life.

Under "Dynamics of Eruption," the most important theories regarding the causes of tooth eruption are given, and the author states as his theory "the belief in the *physiological* processes of growth." This almost seems an evasion of the question.

The following chapter takes up the functions of the dental tissues, a most interesting chapter, and contains some original conceptions which the author admits are new and are yet to be completely verified.

The last chapter is devoted to mammalian dentitions, being, in part, a collection of the various facts found throughout the previous text.

As a treatise upon dental anatomy and physiology, this book is exceptionally interesting. Written in a most delightful vein with superb illustrations and text, the book is a credit to author and publishers, and though its subject may possibly prevent wide reading, it ought to be carefully read not only for much valuable information which it contains, but to see what can really be made of the subject of dental anatomy.

CURRENT NEWS

Items of professional news, of general interest, will be received by the Associate Editor at 51 West Forty-seventh Street, New York City.

DENTAL NURSE BILL NOW BEFORE THE MASSACHUSETTS LEGISLATURE

HOUSE No. 1156

The Commonwealth of Massachusetts

In the Year One Thousand Nine Hundred and Thirteen.

AN ACT

To amend the law regulating the practise of dentistry:

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

1 SECTION 1. Any person who is twenty years of age
2 or over and in the opinion of the Board of good moral
3 character, upon payment of a fee of five dollars, which
4 shall not be returned to him, shall upon application be ex-
5 amined by the Board of Registration in Dentistry and if
6 found competent be licensed by said Board to perform as a
7 dental nurse the services specified in section two hereof.
8 Such license shall be valid for one year from the date
9 thereof unless revoked by said Board for violation of the
10 conditions thereof. Any license issued under the provi-
11 sions of this Act may be renewed from year to year, upon
12 payment of a fee of one dollar.

1 SECTION 2. A registered dental nurse shall be licensed
2 to perform only such duties as shall be specified in his

3 license and solely under the direction and in the office of a
4 registered dentist. Nurses may be employed by schools and
5 institutions; and directions for all their work shall be given
6 by a registered dentist. The dental nurse shall be licensed
7 to perform the service of cleansing of teeth.

1 SECTION 3. Each licensed dental nurse must notify the
2 Board of the name and address of the dentist or institution
3 by whom he is employed.

1 SECTION 4. The Board may, after a hearing, by vote
2 of a majority of its members, annul the registration of a
3 dental nurse for any violation of this act; and, without a
4 hearing, may annul the registration and cancel the
5 license of a dental nurse who has been found guilty of a
6 crime.

1 SECTION 5. The Board shall have power to register
2 in like manner, without examination, any person who has
3 been registered as a dental nurse in another state under
4 laws which in the opinion of the Board maintain a standard
5 substantially equivalent to that of this Act.

1 SECTION 6. Whoever, not being licensed to practise as
2 a registered dental nurse within this Commonwealth, prac-
3 tises or attempts to practise as a registered dental nurse,
4 shall for each offence be punished by a fine of not more than
5 one hundred dollars. Whoever becomes registered or at-
6 tempts to become registered as a dental nurse, or whoever
7 practises or attempts to practise as such under a false or
8 assumed name, shall for each offence be punished by a fine of
9 not more than one hundred dollars, or by imprisonment for
10 three months, or by both such fine and imprisonment.
11 Any dentist who employs a non-registered person to do
12 work specified in Section two hereof shall be fined one hun-
13 dred dollars for each offence. Any registered dental nurse
14 who violates the dental law by performing operations not
15 allowed by the provisions of Section two of this Act shall

16 be fined one hundred dollars for each offence, and the den-
17 tist, in whose employ and with whose knowledge and con-
18 sent the nurse so violates the law, shall also be fined one
19 hundred dollars for each offence.

1 SECTION 7. This Act shall take effect upon its passage.

The dinner of the First District Dental Society of New York State was held on Saturday evening, January 18, in the North Ball Room of the Hotel Astor. Every one seemed enthusiastic and in good spirits and a royal good time was the result.

Being now an annual occasion, this dinner was attended by representatives from all parts of the globe, in addition to those from New York City and vicinity. Consequently there were about 275 men present in all.

These fortunate persons enjoyed an exceptionally interesting lot of speeches on varied subjects, each of which had the distinction of possessing a real point, which was adhered to throughout. President H. L. Wheeler presided, and his short talk on the progress of dentistry and particularly of the First District Society was exceedingly well chosen and appreciated by all his hearers.

Dr. W. W. Walker, who acted as toastmaster, guided things in his usual efficient way, and called upon the following to give short addresses: Prof. F. D. Weisse, Dean of the New York College of Dentistry; Dr. John W. Brannan, President of the Board of Trustees of the Bellevue and Allied hospitals; Dr. E. T. Darby, of Philadelphia; Prof. Wm. J. Gies, of Columbia University; Dr. Calvin S. Case, of Chicago; Dr. Chas. F. Baylis, President of the New York State Dental Society; Dr. N. S. Jenkins, of Paris; Dr. Webster, of Berlin; Dr. Nodine, of New York.

(Notes from Speeches at First District Banquet.)

"We are not only here to congratulate the profession and ourselves upon our past achievements, but we are here to inform the profession that we are going to continue and do even better; that we are going to work, not only to build up the profession in

this city, but we are going to use our utmost efforts to weld the profession of this city into a solid mass, to try and make it of vital interest to the community, the State, and the nation.”—*H. L. Wheeler*.

“Some years ago a few of us thought we would revive the old society, and, instead of going to Chicago and different places for papers we would turn the tables on them, and now they are bound to come to us. We are doing the work, and it is not necessary for the First District Dental Society to go anywhere for papers. We have men in the profession who have charge of sections who can fill any position from one branch of dentistry to the other.”—*W. W. Walker*.

“As a profession, we are the youngest. The medical profession of every country in the world accords to the members of the dental profession the credit which is due them in having built up that profession to the position of importance in which it stands. Dentists, as a whole, are the cleanest living and acting body of men in the world.”—*Prof. F. D. Weiss*.

“We have a very important dental department at Bellevue, Harlem, and Fordham hospitals, and we are about to start one at Gouverneur. Anybody who comes into Bellevue with bad teeth has them cleaned and filled before he goes out. One thing that has interested me very much in this work is that the two professions have worked together.”—*John W. Brannan*.

We are glad to note this co-operation, and feel that all physicians and dentists should work even more in this way than they do. The great undertaking, “Prevention of Disease,” can never be accomplished in any other way.

“I believe it is the duty of every man in the profession to do as much as he can for the younger men who are coming up to take his place by and by. The glory of Christmas is not in receiving gifts, but in giving them; the thing that makes us good is being good to others. And the glory you get out of this is the satisfaction, the sense, the consciousness that you are doing for these young men what they could not, but want you to, and they will, in turn, do the same for those who follow them.”—*E. T. Darby*.

The first dental clinic in New York was started at St. Bar-

tholomew's by Dr. J. Morgan Howe, and other clinics followed with hearty co-operation of Health Commissioners Dr. E. J. Lederle and Dr. Eugene Porter."—*William Carr*.

"It seems to me that advance of knowledge in methods for the prevention of dental diseases is just as important as advancement of knowledge in prevention of other diseases. I have never seen any difference in dignity and importance between a profession stopping a pain in a tooth and one stopping pain in the stomach, or in preventing disease in a tooth and preventing disease in the liver. The teeth are at the gateway of the body, and it must seem apparent to all who give the matter any thought whatever, that the condition of the teeth may mar or make the individual good health."—*Prof. Wm. J. Gies*.

"I never feel so happy as I do when I get among you fellows in New York. All over the country we know you as a body of men who are glad and happy, willing to give credit to the men who have done something in the profession while they are living. You are the people who started it, and the people outside of New York look at your city and think of New York dentists who are capable, and loving, and progressive in every degree."—*Calvin S. Case*.

"I am pleased to note the harmony that exists among dentists in the First District. As I have journeyed around the State I find this same harmony in nearly all sections. It is very gratifying to me to see how closely the members of the profession are interested in other members, and how they are also interested in other sections of the State."—*Chas. F. Baylis*.

"As our profession in Europe has now come to a position of dignity and influence which even ten years ago it was hopeless to expect, so the time is certainly coming when there will be proposed by our European colleagues something which has already done much to enlighten the world in another way—the exchange of academical professors between America and Europe. It is very possibly near at hand when the proposal will be made for an exchange of dental professors between Europe and America. When this moment arrives, God grant we may so grow that there shall be one profession of dentistry throughout the world."—*N. S. Jenkins*.

"We know the First District Dental Society of New York. We look to you as students for much of the advance in the scientific world, and shall go back to New York with a new inspiration, and I want to ask you to bear in mind our meeting in Florence at Easter time. We are looking forward to a very pleasant meeting, and if you will come we will make you doubly welcome."—*Dr. Webster.*

"I think the young men owe a very substantial debt to the older men, and I do not believe in the idea harbored until a short time ago that the real work of the world has been done by men inside of fifty. If we look at the great number of men who have done things in this world we will find the idea is not borne out."—*Alonso Nodine.*

* * * *

The dinner in honor of Dr. Truman W. Brophy took place in Chicago, Saturday evening, February 1. Dr. Brophy, as we all know, is one of the foremost dentists and oral surgeons of the age, and this dinner was only one of the many ways in which his services to the profession are being recognized and appreciated. Nearly 600 were present at the banquet.

* * * *

New York City is in the lead in the establishment of dental clinics, under the direct supervision of the Board of Health. The city itself has just taken this important matter in charge, and has appropriated in the neighborhood of \$40,000 to be used for equipping and conducting seven new dental clinics.

Dr. Matthew F. Carney, who for over a year served as dental interne at Bellevue Hospital, has been appointed Supervisor by Health Commissioner Lederle, and these seven clinics are running under his personal direction. The clinics are located as follows: Three in Brooklyn, two in Manhattan, and one in the Bronx; the seventh being an associated branch of the State Institution for Tuberculosis in Otisville, N. Y.

There has been an outlay of approximately \$1,000 a clinic, merely for the equipment with which to start, and Supervisor Carney has installed the most up-to-date chairs, instruments, etc., in order that the operators may not be handicapped in the

slightest degree, either in the amount or quality of the work that is being accomplished. For the two clinics in Manhattan and for one of those in Brooklyn, two dentists, paid a salary of \$1,200 a year by the city, have been appointed to perform the actual operations. The two remaining Brooklyn clinics, together with the one in the Bronx, have one dentist each, at \$1,200 a year, to act in like capacity, while at the State institution at Otisville, a dentist who gives one whole day a week, is in charge. This man receives \$400 per annum. Besides the eleven men already accounted for, there is the Supervisor of the Division of Communicable Diseases, who has jurisdiction over all cases of tuberculosis, etc., that appear in any of the clinics. This supervisor also has the power to order plates, bridges, etc., regular dental laboratories being paid to do the actual prosthetic work.

It is expected that great good will be accomplished in this way in the prevention of disease in the oral cavity, the treatment of dental caries and in bettering the general health of the patients. No charge is made for this work, so that the facilities offered are within reach of all.

As has so often been said, the oral cavity is the gateway to the body—a truth which is becoming realized more and more. Because of this “higher education” the demand for dental treatment and prophylaxis is constantly increasing, and the masses are more than ever ready to take advantage of the opportunities to obtain these offered by the various communities.

* * * *

As far as we can ascertain, Bellevue Hospital was the first public hospital to establish and support a resident dental interne on the same footing with the other members of its medical corps. A great advantage has been derived from this plan, as the interne has the entire care of all maxillary fractures and also performs much of the oral surgery for the regular hospital patients.

A dentist's knowledge of his special field of work is, as a rule, greater than that of many physicians. Accordingly, the general benefit to patients, resulting from the plan referred to above, is obvious.

Another advantage gained by having a resident dental interne is, of course, the fact that he is present all day every day,

and the amount of work accomplished is much greater in consequence. Many "visiting dentists" give their time one afternoon a week and two or three men, therefore, are at work in the dental ward at Bellevue every afternoon except Sunday.

* * * *

The question of having a new dental dean at Tufts College Dental School is creating quite a bit of discussion among the alumni of that institution. Up to the present time, the dean of the medical department has acted for both branches of the professional schools, and as he is to resign next June, the time seems propitious for a change of policy.

The right of the dental students to be thus represented will be apparent to all, and the Faculty has been approached with this end in view by a committee of ten members of the Alumni Association. When it came to a vote it was found that two of the Dental Faculty had voted with the Medical Faculty, which was to a man against the idea. This is to be deplored, and the action of such members of the Dental School Faculty who thus went on record as being opposed to further progress is hard to understand.

There is not another dental school in the country that has not its own dean, and it seems to be a distinct step backward to delay in any way the proposed change. Tufts Dental School, represented by a large and influential body of alumni, will watch the progress of this question with a great deal of attention.

Dr. Chas. A. Le Clair, Tufts Dental, '09, was quietly married at Providence, R. I., Saturday, February 15. He has removed his office to 1483 Broad Street, Providence, R. I.

Dr. Mathew F. Carney, Tufts Dental, '09, has been appointed Supervisor of Dental Clinics by Health Commissioner Lederle, of New York City. He is already in full charge of the work.

A. G. R.

OBITUARY

DR. EDWIN CHEW.

Resolution Adopted by The Southern Dental Society of New Jersey.

WHEREAS, Our Heavenly Father has, in His wisdom, removed from our midst our friend and confrere, Dr. Edwin Chew, of Salem, N. J.;

WHEREAS, His long association with the members of the dental profession in our State has endeared him to us and inspired the respect and love of all those who came in contact with him during an unusually long and useful career;

WHEREAS, We shall miss his presence and the benign influence which he shed upon all those around and about him;

RESOLVED, That we, the members of the Southern Dental Society of New Jersey, in meeting assembled in Camden, February the nineteenth, One-Thousand-Nine-Hundred-and-Thirteen, extend to his family our heartfelt sympathy in their bereavement, and assure them that we, with them, feel his loss, and deplore the fact that we in the future shall miss his kindly presence and genial influence;

RESOLVED, That this action be spread upon the minutes of our Society, and that the Secretary transmit to his family a copy of the same.

(Signed) ALPHONSO IRWIN, D.D.S.,

For the Committee.

THE ABOVE was adopted by the Southern Dental Society of New Jersey, February the 19th, 1913, by a standing vote.

(Signed) THOS. W. BUNTING,

Secretary.

NOTICES

THE PANAMA-PACIFIC DENTAL CONGRESS.

As one of the attractions of the Panama-Pacific International Exposition, a Dental Congress, international in character, to be known as the Panama-Pacific Dental Congress, is to be held in San Francisco, Cal., beginning on the last Monday in August, 1915, and continuing for ten days.

A Committee of Organization has been perfected, including representatives from the Pacific Coast States—California, Oregon, Washington, Utah, Idaho, Colorado, and Arizona.

This committee is now actively engaged in perfecting the work of organization, including the establishment in every State of the United States and every foreign country, where dental organizations are known to exist, of Executive Committees, which will be empowered to promote the business of the Congress by bringing it to the attention of their national, State, and local societies, and securing memberships and contributions to the programme.

The American Society of Orthodontists and the National Dental Association of the United States of America, have already made arrangements to meet in San Francisco in 1915 as parts of the Congress, and invitations will be extended to other dental societies to take similar action.

The Panama-Pacific Dental Congress is the first organization to apply to the exposition management for space for exhibits and to ask that a definite time be set aside for its meeting.

Manufacturers of dental goods have signified their intention of maintaining, during the congress, the greatest exhibition of dental supplies ever held; ample space for this purpose has already been promised by the exposition authorities, and we are assured of their hearty co-operation in all things pertaining to the success of the congress.

The membership fee has been fixed at \$10, and the finances of the congress are being cared for by a corporation, formed within the Committee of Organization, and known as the "Pacific Dental Congress Commission of 1915."

Over \$8,000 has already been subscribed for promotion purposes by the dentists and dental societies of the Pacific Coast States, and this fund will be increased by many thousands of dollars before the congress meets.

Ample funds for the promotion of the congress are assured, and in due time committees on Local Arrangements, Transportation, Exhibits, Clinics, Programme, etc., will be appointed, and everything possible will be done to ensure the success of the congress and make it in attendance and scientific and professional interest, the greatest dental congress ever held.

The whole world is coming to San Francisco in 1915 to participate in and enjoy the Panama-Pacific International Exposition, which will commemorate the completion of the world's engineering masterpiece, the Panama Canal.

Never in the history of the profession has there been so auspicious a time for holding a great dental congress, and the Panama-Pacific International Exposition Company and the Committee of Organization of the Panama-Pacific Dental Congress unite in a cordial invitation to the members of the dental profession to come to San Francisco in 1915 to attend the congress and view the wonders of the exposition and Pacific Coast of the United States of America.

MASSACHUSETTS DENTAL SOCIETY,

Office of the Secretary,

EVERETT, MASS., February 12, 1913.

To the Editor of THE JOURNAL:

DEAR SIR: The forty-ninth annual meeting of the Massachusetts Dental Society will be held at the Hotel Somerset, Boston, Mass., on Thursday, Friday, and Saturday, May 8, 9, 10, 1913.

Yours very truly,

A. H. ST. C. CHASE. Secretary.

The Journal
of
The Allied Dental
Societies

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ANNOUNCEMENT

Third Cover-page

SUBJECT INDEX FOR MARCH, 1913

[Abbreviations: disc., discussion; rev., review; edt., editorial; ed., edition.]

- ABBOTT, C. EDSON, "The Dental Nurse," 1
- Abscessed Teeth, after treatment of (note), 69
- After treatment of abscessed teeth (note), 69
- Analgesia technique, precautions in (note), 68
- Appointments, Dental, by the Department of Health, edt., 64
- Appropriation, New York City, dental clinics, new, 84
- BACTERIA, VINCENT'S, Oral Infection by. H. S. Vaughan, 11
- Bellevue Hospital, dental interne, 85
- Board of Publication, JOURNAL, 4
- Bodine, John A., on trifacial neuralgia, 46
- Book Reviews, 72
- Boston and Tufts Dental Alumni Association, reports of meetings, 59, 60
- CARNEY, MATTHEW F., Supervisor new dental clinics, N. Y. C., 84
- Carr, William, "Early History of New York State and District Dental Societies," on, 28
- Chemistry for Dental Students, Being Lecture Notes on Chemistry for Dental Students, rev., 74
- Chew, Dr. Edwin, Obituary, 87
- Cleansing root canal broaches (note), 70
- Clinics, dental, new, appropriation. N. Y. C., Supervisor M. F. Carney, 84
- Cocain-Adrenalin, uses of, 67
- Conference, JOURNAL, 3
- "Concerning Dental Legislation," W. P. Cooke, 36
- Cooke, William P., "Concerning Dental Legislation," 36
- Current News, 79
- DAWBARN, R. H. M., on oral infection by Vincent's Bacteria, 57
- Dawbarn, R. H. M., on trifacial neuralgia, 49
- Dental Appointments by the Department of Health, edt., 64
- Legislation, W. P. Cooke, on, 36
- Nurse Bill, text of, 79
- Nurse Question, The, edt., 62
- Societies, N. Y. State and District, Early History of, W. Carr on, 28
- Society, Massachusetts (notice), 89
- Dies, Melotte's metal, 69
- Discussion on "Oral Infection by Vincent's Bacteria and its Importance to the Dental Practitioner," 56
- on "Trifacial Neuralgia; Symptomatology and Clinical Treatment," 46
- EARLY HISTORY of New York State and District Dental Societies, W. Carr, 28
- Extraction, hemorrhage following, 68
- FIRST DISTRICT DENTAL SOCIETY, S. N. Y., December meeting, 46
- GOLD AND TIN FOILS, 67
- HEALTH DEPARTMENT, Dental Appointments by, 64
- Hemorrhage following extraction, 68
- Hints for avoidance of sepsis of dental origin (note), 71
- History, Early N. Y. State and District Dental Societies, W. Carr on, 28
- INFECTION, ORAL, etc., H. S. Vaughan on 11
- Influence of the tongue on respiration (note), 63
- Interne, dental, current news, 85
- Introduction (An) to Dental Anatomy and Physiology, Descriptive and Applied, rev., 76

- KAUFFER, H. J., on trifacial neuralgia, 51
- LEDERER, WM. J., on oral infection by Vincent's Bacteria, 56, 58
- Legislation, Dental, W. P. Cooke on, 36
- MASSACHUSETTS DENTAL SOCIETY (notice), 89
- Maxillary Osteomyelitis (note), 70
- Melotte's metal dies, 69
- NODINE, DR., on oral infection by Vincent's Bacteria, 56
- Notes on Practice, W. D. Tracy, 67
- Notices, 88
- OBITUARY, DR. EDWIN CHEW, 87
- Oral Infection by Vincent's Bacteria, etc., H. S. Vaughan on, 11
- Oral and Other Aspects of Syphilis, C. M. Smith on, 19
- Osteomyelitis, maxillary (note), 70
- PANAMA-PACIFIC DENTAL CONGRESS, The (notice), 88
- REPORTS OF SOCIETY MEETINGS, 46, 59, 60
- Respiration, influence of the tongue on (note), 69
- Reversal of the Taggart Decision, ed., 66
- Root canal broaches, cleansing (note), 70
- Filling (note), 70
- SCHAMBERG, M. I., on trifacial neuralgia, 53
- Sepsis of dental origin, hints for avoidance of, 71
- Shields, Nelson T., "Trifacial Neuralgia," etc. 5; disc., 55
- Smith, C. Morton, "Oral and Other Aspects of Syphilis," 19
- Society, Massachusetts Dental (notice), 89
- Speeches, First District Banquet, Notes from, 81
- Syphilis, Oral and Other Aspects of, C. M. Smith on, 19
- TAGGART DECISION, Reversal of the, ed., 66
- Text-Book of Dental Pathology and Therapeutics, A, rev., 72
- Tongue on respiration, influence of the, 69
- Trifacial Neuralgia, N. T. Shields on, 5
- Tufts College Dental School, concerning new dental dean, 86
- VAUGHAN, HAROLD S., "Oral Infection by Vincent's Bacteria, etc.," 11

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MEETING OF THE DENTAL SOCIETY OF THE STATE OF NEW YORK

The annual meeting of the Dental Society of the State of New York was held in Albany on May 8, 9 and 10, and a goodly number were in attendance at all of the sessions and the clinics.

For the first time in the history of the Society, the meetings were held in the auditorium of the new building of the State Department of Education. This is a magnificent building, a credit to the State, and the members of the Society are to be congratulated upon acquiring the privilege of using this building for their meetings.

The proposed change in the by-laws, which makes every member of every District Society a member of the State and of the National Society, was adopted by a unanimous vote; so that, at the present time, every member of every District Society in the State pays his dues in his local society; the District Society is responsible to the State Society, and the State Society is responsible to the National Dental Association.

The work of reorganization will be completed at the meeting of the National Association at Kansas City in July. Much has been said about the slowness, unpreparedness and general backwardness of the New York State Dental Society; but it is ap-

parent, from the smoothness with which reorganization was accomplished, that both the District Societies of this State and the State Society are quite capable of putting into effect any proposed changes in a businesslike way. I do not mean to say that the reorganization plan, as adopted, may not show some defects which will have to be remedied.

The situation, as it stands, leaves it within the power of every District Society to elect a member of the Executive Council of the State Society, and an alternate member, who shall represent the District Society in the matter of elections at the State Society, and it is within the province and power of every district to choose able and capable men for this business, if the individual members of each District Society have sufficient interest in the matter to do so. It is also within the province of each district under the new organization to name a member of the Examining Board of the State of New York and his alternate, who shall be recommended to the New York Board of Regents for appointment. All the other officers of the State Society and some of the committee are elected by members of the Council and their alternates.

While in session in Albany, and throughout the year, the business of the State Society is done by the members of the Council, the alternate being present and acting in place of the regularly elected member in his absence; but the elections are acted on by both the regular member and the alternate.

All meetings of the Council are public, and any member of any District Society is privileged to attend and to be heard upon any subject that may come before the Council, or an individual member may propose any action to the Council that he may desire.

The plan to have the elections in the hands of the members of the Executive Council is one suggested by Dr. Ellison Hillyer when he was president of the State Society. Its purpose is to

give each district equal representation in the affairs of the State Society, so as to avoid any probability of dissension that may arise from two or more District Societies forming a combination that might exercise a preponderating influence.

It is believed by many of those who have had experience that the present system will continue to maintain the condition that has existed for a long period in the New York State Society, of harmony among all the District Societies.

The Executive Council is not a new and untried experiment, for it has been in existence many years, as the Board to which the business affairs of the Society have been delegated.

This plan was originated to save the time of the State meeting for scientific purposes, and it has been so successful that with some slight changes it has been continued in the present reorganization. The dentists of New York are now in a position, if they desire public recognition, to put forth policies in the interests of the public, to urge the propositions as a solidly organized body of over 1300 members, who, if they desire to do so, can certainly make their influence felt for good in the health affairs of this State.

The members who reported at the meeting in Albany numbered 1305, which gives the State of New York eight members in the House of Delegates at the National Society, with eight alternates.

Dr. W. W. Smith, of Rochester, N. Y., was elected President for the ensuing year; Dr. A. M. Wright, of Troy, N. Y., as Vice-President, and the other officers were re-elected. Much valuable material was presented in the scientific field.

HERBERT L. WHEELER.

**SOME OBSERVATIONS ON MOUTH CONDITIONS AND
RETENTION AS RELATED TO PYORRHEA
ALVEOLARIS FROM THE STANDPOINT OF
THE GENERAL PRACTITIONER OF
DENTISTRY¹**

BY CLARENCE J. GRIEVES, D.D.S., BALTIMORE, MD.

It would be an unpardonable offense to the intelligence of this society and a waste of its time to add to the published proceedings another word on that many named lesion, which we shall for want of a better term call Pyorrhea Alveolaris, unless the time were ripe for some further discussion of the subject from a standpoint a little different; the standpoint of mouth classification made practical for the General Practitioner.

This paper will deal more particularly with the conditions which induce and arise from pyorrhea, rather than that condition proper; it is an appeal for help to the ultimate classification of these dyscrasiæ in their relation to oral states and vice versa, so that all the allied specialists interested in the healing art may consult intelligently on mouth lesions; an humble effort to bring order, even if that order be later proven defective, out of the chaotic "rule of thumb" classification now in use.

The General Practitioner wishes for and is entitled to more light on a number of hypotheses, the basis for his daily practice now in vogue for a number of years. There are few who can read and correctly correlate the latest ideas, scattered here and there, to general practice; while many predisposing bodily conditions are not understood. Our literature is rich in the work already accomplished. If these theories and hypotheses were but collected and arranged according to cause and effect, some salient facts would become clearly evident to the General Practitioner, who could then not only accomplish his work with greater confidence, but be better able to explain to his medical confrere and patients much of the environment in which this work is placed, with more assurance and self-respect.

¹ Read before the First District Dental Society, New York, March 3, 1913

Let us illustrate: We all are proud and justly so of the results of the Oral Hygiene Movement. The promises pledged by the few to civic organizations adopting the procedure have been more than made good; even at this writing enough data has been collected, which is in point of fact the first composite of the systemic benefit accruing to a large number of children from good dentistry. Fifty per cent. increase in body, mental and moral efficiency is the proven record, after the medical specialist had done his best for these children. Such betterment has never been approached: it is one of the most convincing arguments to-day in the science of eugenics.

It is also safe to say that the foregoing facts are familiar to more dentists than any other of the newer data bearing on their work: yet they stand surprised, if of inquiring mind, and from the physiologic viewpoint, very rightly ask, Was all of this betterment accomplished by treating, filling, crowning and, if need be, bridging teeth, the extraction of necrotic roots, eradication of carious areas and the general "clean up" of the oral cavity? Or was it due to increased occlusal efficiency, the restoration to the normal of these planes, the comfortable ability arising therefrom to masticate solids, and the complete change for the better in the type of food consumed, of which we have proof in the daily market bills of the families of these children?

We have accomplished a great service to both the citizen and the State; it has been largely by practising the empirics of "cleaning up" and restoration; cleanliness is good, knowing why you make clean and restore is better; are we to go on practising empirics, or are we going to endeavor to find whence this benefit is derived?

It would seem the simplest thing in the world to say just what had rejuvenated the child, if we could bring ourselves to join in the chorus of nearly all that have spoken on the subject. It runs glibly thus: "The general cleansing of the oral cavity stopped the ingestion of myriads of bacteria and decomposing filth harbored in the carious cavities filled or roots extracted; continued ingestion of these poisonous products interfered with nutrition by deranging digestion and assimilation or damaging the membranes engaged therein, and these saprophytic and

fermenting food particles were absorbed doing toxic damage to the whole economy." All of these causes removed, the child gets well, and there you are.

Is the answer, indeed, so simple? Barring sepsis, we think not. No reference can be found in the literature relative to gastro-intestinal disturbance nor record of lesions thereof arising from the ingestion of the common mouth flora and their products which induce dental caries. Of such Howe¹ says: "In other portions of the digestive tract as the stomach and intestines, these organisms take an active part in the digestive processes." "The fermentation processes that take place in the oral cavity to the destruction of tooth tissue, have, in the intestinal tract, an inhibitory effect upon the microbic destruction of proteids." Thus the micro-organisms which have been definitely associated with the digestion of tooth structure or caries are very valuable digestors elsewhere, and have never been shown to be actively pathogenic; infections in deep caries via the root canal or gingival lesions flowing pus are proven to be due largely to the common *Staphylococcus* and *Streptococcus*. The dangers of pus ingestion are well recognized and will be discussed later. The latest causes assigned for the initial lesion of caries, the decalcification of enamel, are numerous and not clearly elucidated; it is said to be due to fermenting particles of carbohydrate food retained about the teeth, to a definite film of bacteria covering all vulnerable surfaces and cavities, to the oral mucus and its decomposition, etc. All agree that there is no specific organism, that there must exist an agglutinated gelatinous plaque protecting the bacteria and acid products from the dilutions of saliva, and many state that a general acidity of the saliva does not produce dental caries.

What is your working hypothesis for dental caries? Has it not some bearing on your daily operations? The writer accepts the food and nutritional idea of Michaels,² and Kirk,³ and others, faulty food or faulty metabolism, or both. Kirk says: "The catchy formula that 'clean teeth will not decay' is mis-

¹ Howe, P. R. Dietetic Effect on Oral Secretions, Dental Cosmos, Jan, 1911.

² Michaels. Sialo Semiology, Proceedings, Third International Dental Congress.

³ Kirk, E. C. Editorial, Prophylaxis, Dental Cosmos, Feb., 1911.

leading, even if true in the ideal sense—first, because it is equally true that unclean teeth do not necessarily decay; and, second, it is practically impossible to always have clean teeth in the ideal sense. For the reason just stated, dental caries cannot logically or scientifically any more than from the standpoint of observed facts be classed as a filth disease. More particularly has attention been called to the fact that fermenting particles of carbohydrate food debris adhering to tooth surfaces is not in itself sufficient to account for the phenomena of caries of the teeth; that the saliva itself contains fermentable substances as it is excreted from the glands, and that this carbohydrate product of nutrition dialyzed from the blood plasma is the element found in the saliva of caries susceptibles which is the normal pabulum of the lactic acid bacteria concerned in the first stages of tooth caries. Salivary composition is a resultant of nutrition, and that in its turn is dependent, in a large degree, upon food habit." Now, this is not to be misinterpreted as an argument against mouth cleanliness, it simply states a fact and points the question: we expect to keep at "the eternal clean up," especially in this carious diathesis, until we learn better; but it does explain dietetically the enormous percentage of dental caries common to the carious diathesis of childhood characterized by an excess of glycogen, the fermentable carbohydrate, in the saliva and films which normally cover all teeth, which is also definitely associated with the excessive carbohydrate feeding of childhood.

The denture thus disorganized by caries, where mastication is painful and occlusion "lame," the tendency in the daily food intake is invariably toward excess in carbohydrates and sugars because they are soft and easily converted into energy, while the proteids in the form of meats and tough whole grain crusts are more slowly assimilated, cannot be masticated and are bolted. Excessive⁴ intestinal fermentation of carbohydrates and putrefaction of proteids inevitably result, and auto-intoxication begins by absorption of entero-toxins and ptomaines.

Nature is not without her guard against such poisoning. Howe¹ says: "Against the entrance of toxins into the system, nature throws up a triple line of defense; first, the mucous mem-

⁴ Hemmeter, J. C. Diseases of the Stomach and Intestines.

brane of the intestinal tract which absorbs the nutrient media prepared by digestive action before it becomes converted into toxic substances by too prolonged action of fermentative life; second, the liver converts the harmful compounds that have broken through the first line of defense into less harmful substances—intestinal ptomaines and entero-toxins, together with other organic poisons are subjected to powerful toxicolytic action of hepatic cells (Combe); third, the anti-toxic glands, the secretion of which puts into the circulation oxidizing or reducing agents that have far-reaching anti-toxic action."

The guard was evidently not adequate in these children and development of body and mind were interfered with, if not actual disease produced, by the putrefaction and fermentation of food, not lying about the teeth full of carious organisms as the reason given goes, *but lying in the intestinal tract*; and it is well again to emphasize the fact that the occlusion, damaged by caries, is responsible for failure in the child to learn the chewing habit; this marks the difference between the "bolter" and true masticator.

It is not too trite to say at this juncture, that restoration of the occlusion is the life work of the dentist, by orthodontia if you please in youth, by good operative and prosthetic procedure, and the construction of cleanly pyorrhea splints throughout life; the teaching of the correct use of the occlusal planes, in short the making of the denture occlusionally fit, which covers at a word all of our operative procedure, from the prevention of sepsis to the construction of an artificial denture. This is real dental service.

We have entered into greater detail in the foregoing than might seem necessary because the intestinal conditions are much the same whenever the occlusion is long out of commission; the chewing habit impossible, never learned, or lost, no matter what the cause; carious cavities, missing teeth, malocclusion or pyorrhea, all similarly lame the denture; the bolting habit begins and auto-intoxication always results, when the triple guard mentioned fails.

We hear much in these later days of the value of Oral Prophylaxis as preventive of intestinal disease by stopping in-

gestion of decomposing food from about the teeth, but we doubt it seriously for the reasons just given. Prophylaxis consists principally of monthly massage and cleansing of the entire denture with abrasives and suitable adjuncts; it is, of course, useful for removing films in the carious diathesis and for prevention of recurrence of foci for deposits in pyorrhea, but in the nearly normal mouth, this process is a bacteriologic mystery. Even in carious and pyorrheal mouths, it is hard to understand how this most thorough rubbing of tooth surfaces for one hour or more will prevent recurrence for the other twenty-nine days, the allotted time for the next visit, particularly in such an ideal culture medium as the human mouth. Let one carious cavity or a few pyorrhea pockets disable one-half of the denture, and that side will need prophylaxis every day until the cavity be filled and the pyorrhea teeth be made occlusally fit; a thorough cleansing then is necessary, and occlusion, with the efforts of the patient, will do the rest.

It is well to remove films from the teeth if you know them to be harmful, but did it ever occur to you that such films of putrefying proteid elements might be alkaline and protective of enamel surfaces in certain conditions, just as fermentation of the carbohydrate glycogen, which we know to be acid, is damaging to such surfaces in the carious diathesis? Hear what Miller⁵ says of what covers these surfaces, where in examining one hundred teeth taken at random from one thousand in two different experiments, staining with eosin and the Gramm method, he found films of organisms on all surfaces of all teeth except the occlusal. In examining the teeth of his colleague, Dr. York, who was immune to caries and whose teeth were highly polished, he found these films restricted to the cervical and proximate portions. He says further of tooth films, "If the surface of the tooth is coated with a greasy layer of mucus, epithelium, etc., there will be putrid decomposition with alkaline reaction, which again may be most intense directly on the surface; *in such cases it is conceivable that the film might serve as a protection to the tooth.*" Black⁶ describes these deposits by saying, "Such coat-

⁵ Miller, W. D. The Presence of Bacterial Plaques on the Surfaces of the Teeth and their Significance, Dental Cosmos, 1902.

⁶ Black, G. V. Discussion of Miller's Paper—A Study of Certain Questions, Relating to Pathology of the Teeth, Proceedings, Fourth International Dental Congress, Vol. 1.

ings are found plentifully over the surfaces of teeth of immune patients, and also in others where there is no decay of enamel. Careful study shows that many kinds of deposits upon the teeth present similar appearances, when seen in microscopic section, to those produced by gelatinous plaques, and yet seem to have no influence whatever on the localization of caries." Thus, we take it, that these films are the normal dental coverings, that they immediately redeposit if removed and that they are protective or destructive according to diathesis and food habit. If they exist in clean mouths, what then are dirty mouths? Professor Halliburton has said, "Dirt is matter out of place," or words to that effect, and we reason that such coatings are not "out of place" unless damage is done to the teeth and soft tissues; they have their place in the healthy mouth, no matter how offensive they may be from lack of toilet. Decomposing food debris is decidedly "matter out of place," hence dirty, and should be removed. The dental ideal should be to get the patient to a state in which he can make himself clean orally, without resorting to prophylaxis every month.

Michaels,² Kirk,⁷ Black,⁶ Howe,¹ Ferris,⁸ and many others insist on the dietetic and nutritional balance as related to all dental disorders. Aside from actual systemic disease, which of course has its effect on the mouth, all oral pathology has for its predisposing cause the nutritional and malnutritional element. Accordingly no mouth classification is complete that does not recognize the mouth as an integral part of the gastro-intestinal tract both in its secretory and excretory function. It is impossible to examine a series of mouths without being impressed with the type of damage done to the teeth and adjacent tissue, or the lack of it; the periodicity of such disease, the lack of recurrent caries in the pyorrhea mouth and its total absence in eroded dentin areas during the process of erosion, after which these areas quickly become carious, etc. The record of the past is thus plainly written, and it should give some idea of the present status, some inkling for the future. You may indignantly deny that you are using a mouth classification, and yet subconsciously you balance your

⁷ Kirk, E. C. Discussion Report of Committee on Scientific Research, Dental Society State of New York, Dental Cosmos, 1906.

⁸ Ferris, H. C. Reports of Committee on Scientific Research, National Dental Association, 1909-12.

observations and experience against the result of reading and thought and act on the case in hand. The dentist must classify the mouth environment in which he daily works. The diagrammatic scheme shown herewith, with additions, was presented to the Indiana State Dental Society two years ago. It is the writer's ⁹ compilation made for personal use from the best authorities; wrong in part, perhaps, subject to correction and change when good reason can be given. It has been a great help. If you do not like this classification by all means make another; but at least have one.

We classify mouths by food habit, nutritional balance, and diathesis, short of systemic disease, into three grand types, Near Normal, Hypoacid, and Hyperacid Diatheses, realizing that each type may pass into the other at different periods; that some types may be coincident, and that there are others, not sufficiently pronounced, as the senile for instance, to deserve a heading.

MOUTH CLASSIFICATION AS RELATED TO THE FOOD HABIT AND
NUTRITIONAL BALANCE.

Normal or near normal mouths.

Patient, any age.

Mouth can be kept clean.

Systemic State—Biochemical changes equally balanced; metabolism normal; proper digestion and assimilation of the correct percentage of Carbohydrate and Proteid food.

Saliva—Neutral or slightly acid.

Mucus—Alkaline, medium in quantity, existing independently in "ropes," depositing on all oral surfaces.

Sulphocyanates, Ammonia, Chlorides, Phosphates—Percentage small.

Glycogen—Traces.

Caries—Medium in amount, dark and slow, few fillings with slight recurrence, except in retention centers for food.

Erosion—None.

Salivary Calculus—Medium in amount about the lower incisors and superior first and second molars, producing no gingivitis.

Serumal Calculus—None, but frequent sulphid and other stains.

Pyorrhoea—None.

⁹ Grieves, C. J. The Cement Line in Inlays, Dental Summary, Oct., Nov., Dec., 1911.

Films on Teeth—Exist on all surfaces of all teeth, open to the wash of saliva; alkaline, due to putrefaction of proteid content.

MOUTH CLASSIFICATION AS RELATED TO THE FOOD HABIT AND NUTRITIONAL BALANCE—MOUTHS OF HYPOACID DIATHESIS.

Age of Patient—Infancy, Childhood, Youth, Puberty, and some time after.

Carious Mouths—Dirty, cannot be kept clean.

Systemic State—Oxidation high, decrease in organic acids, increase in excretion of saline chlorides, defective metabolism of carbohydrates, an excessive amount of which exists in the diet.

Saliva—Acid, thick and ropy, odor and color, from the

Mucus—Which is abnormal as secreted, containing a high percentage of carbohydrate.

Sulphocyanates—None.

Ammonia—Chlorides, phosphates, in excess.

Glycogen—Greatly in excess.

Caries—Excessive, rapid, white; always recurs no matter what the operation; gingival white lines of decalcification.

Erosion—None.

Salivary Calculus—In excess.

Serumal Calculus—Occasionally; sulphid and other stains in excess.

Pyorrhea—None, but gingivitis frequently.

Films on Teeth—A thick impermeable "acid felt" everywhere, from the carbohydrate fermentable element in the contained mucus.

MOUTH CLASSIFICATION AS RELATED TO THE FOOD HABIT AND NUTRITIONAL BALANCE—MOUTHS OF THE HYPERACID DIATHESIS.

Systemic State—Oxidation low, increase in organic acids, biochemical changes delayed, faulty metabolism and excessive proteid feeding, associated with arthritism, auto-intoxication, etc., expressed by the two oral conditions A and B often merging.

Age of Patient—Middle life, after growth ceases and consolidation begins, though they may occur at any time.

A.—Erosion—Mouths which look too clean.

Saliva—Acid from acid sodium phosphate et al., clear and limpid.

Mucus—Little or none; that secreted is apparently in solution.

Sulphocyanates—Greatly in excess.

Ammonia—Chlorides, phosphates, medium in amount.

Glycogen—None.

Caries—Very little.

Erosion—In excess, on cheek and lip contact; frequently accompanied by clean gingival recession without irritation.

Salivary and Serumal Calculus—None, no sulphid nor other stains.

Pyorrhea—Typically none, through this the other type of hyperacid state may coincide.

Films on Teeth—Few and only in the embrasures, open to the wash of the acid saliva.

B.—Pyorrhea Mouths—Teeth dirty cervically from gingival waste and calculi.

Saliva—Neutral or slightly acid, made alkaline cervically by tissue waste and pus.

Mucus—Little or none.

Sulphocyanates—Greatly in excess.

Ammonia—Chlorides, phosphates, in excess.

Glycogen—None.

Caries—Little or none, considering the numerous retention centers caused by loss of alveolus and gingivus.

Erosion—Typically none, though this the other type of hyperacid state may be coincident.

Salivary and Serumal Calculus—In excess and recurring interstitially, staining of all types.

Films on Teeth—"Materia Alba" Sordes greasy and alkaline from putrefaction and pus.

Pyorrhea—In all stages from gingivitis to phagedena with or without serumal deposits; cheesy deposits or pus resulting frequently in oral sepsis.

Note the relation of diet, particularly the products of digestion as affecting nutritional balance, and both as related to oxidation and oral disease. For instance, the mouth type in the Hypoacid Diathesis, the period of youth and high oxidation, accompanied by excessive carbohydrate feeding and caries in excess,

characterized by the secretion, with the mixed saliva of a fermentable carbohydrate element (glycogen possibly), associated with a great amount of tenacious mucus which agglutinates the glycogen to enamel surfaces. This is the ideal habitat for acid fermentative organisms and is productive of enamel decalcification, the initial lesion of caries. Observe the coincident lack of sulphocyanates and excess of glycogen; the saliva is acid, presumably from lactic acid, germinated directly in the tooth films—a *general bacterial acidity*.

Quite the opposite are the mouth types of the Hyperacid Diathesis. The period of middle life and after, the time of sub-oxidation; general arthritism, not in the sense of joint disease, but as a diathesis, may be accepted as typical. Whatever the food habit, it tends largely to proteid excess; owing to the limited¹⁰ oxygen carrying power of the blood, the assimilated carbohydrates are first burnt up, because they are more easily oxidizable. This causes suboxidation of the more complicated metabolism of proteids and the results are the same as if an excessive amount of proteid had been taken. The two-mouth expressions of this defective metabolism are the erosion and pyorrhea types. In the expression marked by erosion, the sulphocyanates are in excess with little or no glycogen, hence little caries; the buccal mucus, which is scanty, contains the acid sodium and calcium phosphate which attack enamel surfaces, producing erosion. There are few tooth films, possibly owing to lack of mucus and glycogen as a pabulum for bacteria; the saliva is generally acid from the sub-oxidation of carbohydrates expressed orally by acid salts of sodium and calcium—a *systemic acidity*.

In the expression marked by Pyorrhea, the sulphocyanates are still in excess, with little or no glycogen or mucus and with little tooth caries; this is remarkable considering the numerous food retention centers caused by gingival recessions, any one of which in the near normal mouth would produce caries. It may be explained by the continual discharge over these tooth surfaces of tissue exudate or pus, which is alkaline, excessive and recurring interstitial deposits of serumal calculi, or the differing types

¹⁰ Kirk, E. C., The Constitutional Element in Certain Dental Disorders. Dental Cosmos, 1903.

of degeneration of the peridental membrane and the absorption of the alveolus, etc. The saliva is alkaline, either from tissue waste, the presence of ammonia, chlorides, et al., or resulting from suboxidation of proteids. Lying between the Hypoacid and Hyperacid diathetic mouth types and gradually merging into each according to variation in diathesis, is the Normal or Near Normal, where the body processes, consequently the excreta indicated in the saliva, urine, etc., are equally balanced. Slight caries only, occurs in the adolescent period, but does not recur, except when retention centers are produced about the teeth for fermentation of carbohydrate food producing *areas of local acidity*.

Hardly an office day passes but that we are reminded by the cases present of the dangers of pus absorption or ingestion from the mouth; in fact, the observant physician is now so keenly alive to this portal of entry for systemic disease, that he actually looks at something in the mouth other than the tongue. The trouble is that when he looks he is about as well prepared to intelligently diagnose the mouth condition as the dentist is prepared to diagnose the general systemic states which are said to proceed therefrom. If he be progressive, discarding mouth washes as useless, he sends the patient to his dentist with the statement that "This is an Arthritic who has pyorrhea, the cause of his condition, which must be cured or the teeth extracted; at any cost, this condition of 'oral sepsis' must be corrected." Now it may prove a true pyorrhea; it is just as apt to be a slight gingivitis or what the "doctor" squeezes from the gingivæ, mistaking it for pus, may be the greasy gingival "*materia alba*" of Leeuwenhoek. In any event the dentist realizes that he must live up to the prophylactic doctrines of his profession; he must do something quickly or lose caste with medical man and his patient. It is more than likely that he has sat patiently for years, listened to and read articles saying *that pyorrhea was the result of arthritism*, auto-intoxication, diabetes, etc., and *not the cause of these conditions*; laterally he has heard papers, and stood by the clinic chairs of men who proved "this systemic dope all bosh"—pyorrhea being all local and being cured notwithstanding the "theorists." Did the Arthritism cause the pyorrhea,

or the pyorrhea cause the arthritism? That is the paradoxical predicament of the general practitioner; he is asked to cure a disease that is both cause and effect. What is he going to do about it? Answer, very little; about as much as the general practitioner has done in the past without the help of the pyorrhea specialist, and incidentally every town cannot support such a specialist. The dentist, therefore, needs help of a more substantial practical sort than pure theory which cannot put to practice, and practice unsupported by etiology. There is no greater need in our profession to-day than for a series of symposia on this subject, attended by all the allied specialists and scientists who have a common interest. The results would prove most interesting. Pyorrhea has long been associated as a cause by such authorities on Arthritis as R. Llewelyn Jones,¹¹ Cave,¹² Goldthwaite,¹³ Painter and Osgood. It has also been associated as a result of arthritism by our best authorities, Kirk,¹⁴ Talbot,¹⁵ Rhein,¹⁵ and Fletcher.¹⁶ These two schools have much in common, because next to sepsis, the one great predisposing cause of arthritis is thought to be excessive intestinal fermentation and putrefaction (Hoke,¹⁷ Andrews,¹⁷ and Herter,¹⁸), and this, in turn, is one of the principle causes of pyorrhea. A joint meeting of these orthopedists, dental scientists, and the pyorrhea specialists might correct this confusion. Physiologic chemists, experts in metabolism, specialists in stomach and intestinal diseases are all deeply interested in the ingesta from diseased mouths. In a symposium they might learn of us, and we certainly need their assistance.

Finally, that "our own house be in order," all those specializing in pyorrhea, and they are doing a great work in our profes-

¹¹ Jones, R. T. Arthritis Deformans.

¹² Cave. *Lancet*, Aug. 3, 1901.

¹³ Goldthwaite, Painter, and Osgood. *Diseases of the Bones and Joints*.

¹⁴ Kirk, E. C. Dental Relationship of Arthritism, *Proceedings, National Dental Association*, 1909.

¹⁵ Rhein, M. L. Oral Expressions of Malnutrition, *Odontological Society*, 1896; *Pyorrhea Alveolaris*, Chicago Dent. Soc., 1899.

¹⁶ Talbot, E. S. *Interstitial Gingivitis*.

¹⁷ Andrews and Hoke. A Preliminary Report on the Relation of Albuminous Putrefaction of the Intestines to Arthritis (Rheumatoid and Osteo) and its Influence upon Treatment.

¹⁸ Herter. *Lectures on Chemical Pathology*.

¹⁹ Fletcher. *Proceedings American Medical Association, Section on Stomatology*.

sion, should have their own society, correlate its literature, accept a pathology and etiology and establish a school, not of the "sporadic one-man type," but with a full faculty. Consider for a moment the wonderful results achieved in the field of orthodontia in this relation. Starting with a few men whose only idea was to straighten teeth, a classification for malocclusion is found; schools, societies, and a literature result. Calling to their help the best from all allied sciences, they now realize that in correcting malocclusion they are curing nasal and pharyngeal defects and assisting delayed development, with the result that the laryngologist to-day refers as many patients to the orthodontist as does the dentist. These orthodontists daily teach the dentist something of their specialty. How can the general practitioner learn anything from the pyorrhea specialists, when scarcely any two of them agree as to surgery or retention, and none of them agree on the etiology of the lesion they treat? It is the writer's firm conviction that a true pyorrhea cannot occur without some predisposing cause, no matter what the local primary lesion may be, malocclusion, local irritation, etc. It must be remembered that every one of us have, some time in our lives, suffered gingival lesions of no greater import than those described as the cause of this disease by the "localists," and yet all of us are not suffering from pyorrhea, although we have been told so by the pyorrhea specialist. On the other hand, there can be no doubt that much harm has resulted in the past from this very doctrine that pyorrhea is always caused by a constitutional vice, for the general practitioner reasoned that local treatment was useless and quit. There is also no doubt that the little band of operators who insisted that the causes were "all local" and so treated pyorrhea, accomplishing many cures, have done the whole profession a great service. The astonishing thing is that these opposing views cannot be harmonized. Why cannot our attitude be that of the orthopedist who treats all other body joints, except the gingival, in that tremendous field of arthritism and its expressions? While recognizing the predisposing cause to be the diathesis, he admits the role of sepsis and intestinal putrefaction. All of these hypotheses fail in many cases and there is much to learn, yet he aims at all in his treatment and blots out every

portal of infection by surgical procedure, frequently applied to the joints. He does not despise local adjuncts, as massage and manipulation, lotions and corrective mechanical appliances; *but he never for a moment forgets the diathesis, the main effort after all is to correct that.* If perchance a case is cured by local means, he does not immediately announce that the causes of rheumatoid arthritis, for instance, "are all local." The relief afforded by pyorrhea surgery, in well authenticated systemic pus poisoning cases reported by Hutchinson,²⁶ Hartzell,²⁶ and others, which we so gladly accept, is the most convincing argument yet advanced as to the general constitutional causes of these lesions. These cases prove the purely local view as untenable, and that pyorrhea treatment is only at its best in a purview of the whole field of causes; for in an advanced pyorrhea, such as we judge these were, a vicious cycle exists, one end of which was obliterated by the treatment and the circulation thus relieved of the immense burden of resistance to pus absorption. Just as soon as it is admitted that the slow absorption of pus organisms, attenuated or their toxins, from the alveolus, will produce defects in the blood stream and vessels (endarteritis largely, and the tissue changes following) elsewhere, as in a heart valve, kidney, or joint, which is proven by the cases reported, then we must also admit the reverse; that slow absorption of sapremic products from the intestinal tract (just as harmful as toxins from ingested pus, from the failure to function of the triple guard against auto-intoxication previously quoted), from an inactive liver or a damaged kidney, will produce the same circulatory disturbance and endarteritis in the vessels of the alveolus and peridental membrane. For the same membranes, circulation, and tissues are involved in each, except that we have added always the element of infection in the mouths. It matters little whether the parts damaged be the articular facet of a long bone or the alveolus, the membranes of the heart and kidney or the peridental membrane: the absorption by metastasis will change the picture very slightly. You cannot "run with the fox and hunt with the hounds" in this matter.

²⁶ Hutchinson, R. G. What Constitutes a Cure of Pyorrhea Alveolaris and how to Accomplish, Discussion, Dental Cosmos, Oct., 1910.

²⁶ Hartzell, T. B. Post Operative Treatment of Pyorrhea Alveolaris, Proceedings, Nat. Dent. Assoc., 1912.

In a recent review of Peter Daniel's work on Arthritis, the last word on this subject, the reviewer says, "Sepsis and Arthritis—this is the sequence of events." "Daniel²⁰ has found that by far the commonest cause of Arthritis is sepsis in the oral cavity—a fact to which all experienced clinicians subscribe." The medical specialist is alert to pus absorption from the mouth; he does not always know the causes for pus formation; so far he has left that to the dentist. Will he continue to do so? We think not, for he has already coined the term Oral Sepsis; no sooner introduced, than accepted, it now has a place in his literature, and stands as his effort at a classification of mouth disease. Of the "omnibus type," it includes much of our oral pathology at a breath. Surely this classification cannot be accepted or used by the dentist, whose business it is, after all, to correct all these ills. and who will finally be called upon to say just what oral sepsis is?

Colyer²¹ gives the best definition, when he says: "The term oral sepsis is used not to denote a specific disease, but collectively to include all chronic inflammatory diseases about the mouth—there occurs an increase in number and variety of organisms commonly found in the mouth, especially those of the pyogenic class. Under altered environment many of these organisms may undergo change in virulence in the direction of exaltation or attenuation—some of those which were non-pathogenic may become pathogenic. The catarrhal and suppurative products which result from bacterial activity undergo putrefactive change, and in this condition are constantly passing into the gastro-intestinal tract with enormous numbers of bacteria." It is apparent that the term covers all inflammatory mouth processes, and it is to just this lack of definition that we object; if the term pyorrhea alveolaris stands for confusion in pathology, then oral sepsis is "confusion worse confounded."

How would you treat a case of oral sepsis? You would proceed to find what the mouth lesions really were. Barring major surgical cases, syphilis, tuberculosis, stomatitis, etc., and such unusual conditions as angina, noma, leukoplakia, etc., there are three large common groups of septic types—viz., dento, alve-

²⁰ Daniel, P. Arthritis, reviewed in American Medical Journal, 1912.

²¹ Colyer, J. F., and Stanley. Dental Disease in its Relations to General Medicine.

olar and peridental abscess, and the different stages of pyorrhea, from gingivitis progressively onward. We can now classify cases of oral sepsis as follows:

A. Tissue exudate and pus freely evacuated into the mouth from pyorrhea, fistulous dento-alveolar abscess, or from any freely draining surface. Ingestion and absorption of pyogenic products via the gastro-intestinal tract.

B. Tissue exudate and pus retained in the alveolus from chronic "blind" dento-alveolar abscess and peridental abscess, pressure absorption via the blood stream by metastasis.

C. A combination of the foregoing in advanced pyorrhea and dento-alveolar abscess, or deep necrotic surgical areas, which only drain occasionally. Pus retention below the level of drainage; damage results by methods in A and B.

From what can be learned, Classes A and C are those which were associated with the serious constitutional states mentioned by Dr. Hunter, to whom we are deeply indebted for crystallising in one word the growing conviction in the minds of many of the seriousness of diseases arising from pus in the mouth. For years the best element in our profession have preached this crusade of clean methods in all mechanical and surgical procedure, just because they were clean; apparently they had not been heard, but everybody seems to have heard Hunter. The lesions classed as B are quite as dangerous, if less apparent than the freely flowing pus cases, of A and C; their serious relation to diseases of joints, muscles, heart, kidney, etc., have been shown in this country by Billings,²² Rhein,²³ Gilmer,²⁴ and the writer.²⁷

"There ³¹ is hardly a pyorrhea case, however, in which certain teeth, having lost some of their foundation tissue which can never be restored to its full function, do not need mechanical

²² Billings, F. Chronic Focal Infections and their Etiologic Relation to Arthritis and Nephritis, *Arch. International Med.*, Vol. 9, 1912.

²³ Rhein, M. L. Mouth Infections, their Etiology and a Consideration of what Effects They May Have upon Vital Organs and other Tissues, *Jour. American Med. Assoc.*, Feb. 15, 1912.

²⁴ Gilmer, Thos. L. Chronic Oral Infections, *Arch. International Med.*, Vol. 9, 1912.

²⁷ Grieves, C. J. Systemic Pus Poisoning Associated with Diseased Apical Regions, *Items of Interest*, Feb., 1911.

³¹ Grieves, C. J. Pyorrhea Retention and Dentures, *Dental Cosmos*, March 1912.

retention. In the very nature of the disease at this stage, no matter how perfectly prophylactic treatment be administered, the stress of occlusion even if altered will surely do permanent damage. It is at this stage that the most skillful retention is needed. The patient needs it to save his teeth; the pyorrhea operator needs it lest the results of his work be lost; for the ultimate result rests in the hands of the operator who retains the case. Clinically speaking, therefore, this is one of the most important and difficult operations in the ever-increasing field of operative dentistry." It behooves us to look for a moment into the principles of "splinting."

The mechanical picture is familiar to all. The muscles of mastication exerting the same force on the denture as was applied before the disease began, exert the power, which is applied to the food, and which is the load, by the depth of cusping of the occlusal planes; just as these are deep, the lateral stress is greater. Supporting these cusps are peridental membranes destroyed in the gingival third or more, and an absorbing alveolus.

Naturally, the question arises as to the type of tissue resulting in the alveolus and peridental membranes from successful pyorrhea surgery. This cannot be definitely answered. Some claim to show by skiagraphs, new bone in the alveolus attaching the tooth. A new alveolus is most desirable, a bone of attachment for the root is decidedly objectionable. From the standpoint of comparative anatomy no mammalian temporo mandibulular articulation applies its power to a cusped tooth with a bone of attachment. This is one of the reasons for failures of implanted teeth. Others claim a new set of gingival fibres in the peridental membrane. This is hardly possible, for the peridental membrane is a special organ with special sets of fibres functioning differently in all parts, particularly the gingival third. Once destroyed, they are never restored. There certainly is some new attaching tissue, as confirmed by many examinations, and until we have more definite data, a white fibrous connective tissue will have to be accepted, as it is nature's method of repair elsewhere.

The primal law for splinting is fixation of loosened teeth to each other, and these in turn to teeth with normal membranes,

which are most desirable, for the normal sway in occlusion is then allowed the whole piece, and the fibres of membranes of the pyorrhea teeth can be expected to return more nearly to the normal than when all are loose. Malocclusion is one of the contributing local causes of pyorrhea; and after the disease has progressed, all the teeth affected malocclude, due to loss of foundation tissue and to tilting. This malocclusion must be relieved—not by orthodontic methods, because it is next to impossible for the membranes to meet the stress again with the normal height of cusp, but by grinding an entirely new series of occlusal facets. If retention be done, the splint should be applied to the teeth in their tilted relation; and if the point of occlusal impact fall too far out of the line of the long axis of the tooth, it is much better practice to excise and crown back into the occlusion. This is one of the reasons fixed bridges have been such admirable mechanical retainers, though far from hygienic; the cusps of the bridge dummies and abutments are comparatively flat and in correct relation to the long axis of the root. In all splints of whatever type, the most careful attention by judicious grinding must be given the new occlusal facets which form and deepen; for months after the piece is “set,” the whole apparatus, including retained teeth, will drift, and it therefore should be seen more frequently by the operator who applies the splint than by the prophylactist.

The ever-increasing number of small anchorage devices, combinations of hoods with staples or pins, inlays and pins, bars, etc., we thankfully use as bridge abutments without doing violence to the pulp in small cases; but in the denture disorganized by pyorrhea, in which there are few small cases, and these invariably sway even after splinting, it is far better to apply the rule, also good in bridge work, that just as more multiples are added, giving greater root divergence and crossing the arch, so is the piece more apt to retain. In large bridge cases the heaviest type of abutment crowns must be employed. It is the consensus of the best opinion among bridge workers that these can be correctly made to parallel and protect the inclosed tooth from caries, with few exceptions, only by pulp devitalization and clean root canal surgery.

At first glance it would appear that there is less strain on

abutments on firm teeth in splinting than in bridge work, because of the support supposed to ultimately result from the teeth retained, while in the bridge the whole strain falls upon a few piers. This we are convinced is a fallacy, and is more than counterbalanced by the risk of tipping of the teeth retained. Bridge pier abutments always have healthy periodontal membranes. This cannot be said of even the best teeth remaining in a pyorrhea mouth; occlusal stress is always greater in the splint than in the bridge, no matter how carefully the facets are watched, so there is more occasion for good anchorage on the abutment piers in the splint than the bridge.

If this be true of the abutments, it is far more true of the teeth to be retained. There is no element of "sag" or "sway" in bridge dummies. This is the greatest element of weakness in the splint, for the fibrous character of the foundation tissue of the teeth retained, allows "tilting" or "backing out" of the retained tooth upward into the alveolus, calling for repair; one tooth loose in the midst of a large retainer is a most embarrassing situation. It is difficult to understand how a retention operator can expect a sixteen-gauge wire with a few short pins set in grooves in vital teeth or a series of attached inlays which do not penetrate pulp chambers to splint permanently teeth so loose as to move out of place and have to be held, while the splint is being set. The lack of parallel in tilted pyorrhea cases makes anchorage almost impossible without pulp exposure, and in the writer's experience there is but one safe plan—i. e., pulp devitalization, and even deeper anchorage in teeth to be retained than in the piers.

This raises the inevitable question of pulp devitalization in these cases, and it has the sanction of every microscopist who has cut sections of pulps in pyorrhea mouths. The same dyscrasia which produces absorption of the alveolus, affects the vessels of the pulps of the teeth to be retained, producing degenerations either of the soft type or calcification to almost complete obliterations of the pulp canal. If we grant the causes of pyorrhea to be local, and can still believe in the systemic effects of pus absorption, then, as has been shown, pus absorption into the circulation from a pocket on a tooth may be damaging the pulp of

that same tooth. The supposition is that, if the membrane and alveolus of a tooth are diseased, the pulp is also affected, and vice versa. That may be correct, but no assurance can be given as to when other teeth may be attacked. With a splint in place you can give attention to the pockets, which becomes most difficult to give to the pulp which is not visible.

It is very easy to say that all such pulps shall be removed and the canals sealed, but it is a very difficult matter, particularly in the calcification cases with occluded canals, where the risk of perforation or imperfect root work adds infection from dento-alveolar abscess to the pyorrhea pocket. All things considered, however, the writer will take the risk of apico-ectomy or even extraction, in these cases, rather than leave pulps which by degeneration will eventually ruin the whole operation. It is better by far to err on the side of extracting too many loose teeth than to leave one or more in the midst of a large splint, subject to constant recurrence of pyorrhea and liable to produce pus absorption. Such may be restored by the fixed bridge, which is a good splint, but is open to the objection that many root pockets cannot be reached for instrumentation. The older forms of removable bridges and partial plates, while removable, and leaving open these areas and much cleaner, produce lateral stress on the teeth retained which will eventually destroy them, and therefore are not to be considered. The best type is that in which the splint firmly attaches the remaining teeth by bars and is independent of the denture, which is removable, generally by some form of attachment to these bars. The newer forms of removable bridge work, particularly Hartzell's²⁸ splints, are the most desirable found for later denture and splint.³¹

Lest we become too enthusiastic in this type of work, we cannot do better than close this paper with the latest utterance from G. V. Black.³⁰ It stands as a warning:

"I want to say to the dentists who are here that I have been objecting seriously to these long-drawn out efforts at curing pyorrhea alveolaris. Of all the things that is one among the

²⁸ Hunter, Wm. Oral Sepsis as a Cause of Disease in Relation to General Medicine, Brit. Med. Jour., Nov. 19, 1904.

²⁹ Black, G. V. Discussion, Oral Infection in Relation to Systemic Disease, W. E. Post. Dental Review, Feb., 1913.

³⁰ Black, G. V. Pyorrhea and Its Prevention, Items of Interest, June, 1911.

worst, to keep a patient continually draining pus from these practically hopeless cases for years, and expect them to retain good, vigorous health. These patients become anemic and sick in spite of treatment, and we are doing wrong; and I think Dr. Hunter was right when he gave the dental profession a lashing for allowing these foci of infection to continue in the mouth. We had better lose teeth and make plates with which patient can chew food and do it quickly, than to allow these things to run on from year to year and have the alveolar processes melt away; for when such a patient does lose his teeth, his mouth is in no condition for a good set of artificial teeth, because of the loss of the normal alveolar ridges. He is in trouble for the rest of his life. We should not let these things continue."

A METHOD OF RETENTION¹

DR. STEELE F. GILMORE, INDIANAPOLIS, IND.

The prosthetic branch of dentistry is, in a certain sense, more exacting in its requirements than the average practitioner is willing to admit. The operator who undertakes to supply his patient with an artificial substitute for lost organs of mastication cannot confine his efforts to esthetic effects alone, for utility and comfort must accompany the artistic. Since utility and comfort are features co-existent with retention and stability, we are safe in saying that the most important phase of prosthetic dentistry is retention. We may so arrange the teeth of a denture as to almost defy detection. We may succeed admirably in restoring facial contour. In fact, the substitute may measure up to the ideal standard in all of the above mentioned requirements, still be lamentably at fault in stability.

We covet an expression of satisfaction on the part of the patient. It is *the* goal we are, day after day, striving to reach. I will not impose upon your patience by undertaking to discuss the merits and demerits of a large number of methods and devices for holding in position artificial teeth. All methods and systems are dependent on physical laws, classified as follows: Atmospheric pressure, frictional contact, tenso-friction, dowing and cementation. Before the era of cementation, the most popular and practical agent was the vacuum or atmospheric pressure, and is still, under certain conditions, our only resource. However, atmospheric pressure is an elusive agent, refusing at times to be harnessed, thereby creating within us a disposition to avoid its employment if at all possible, urging us to the conservation of a natural organ, to the end that it may be used as an anchor for its artificial neighbors.

Formerly, and still to a limited extent, the operator feels justified in encircling a natural tooth with a spring band or clasp as a means of retention. It is a method having reasonable mechanical features, but usually an unwholesome effect on the

¹ Read before the Section on Crown and Bridge Work of the First District Dental Society, New York City, April 16, 1913.

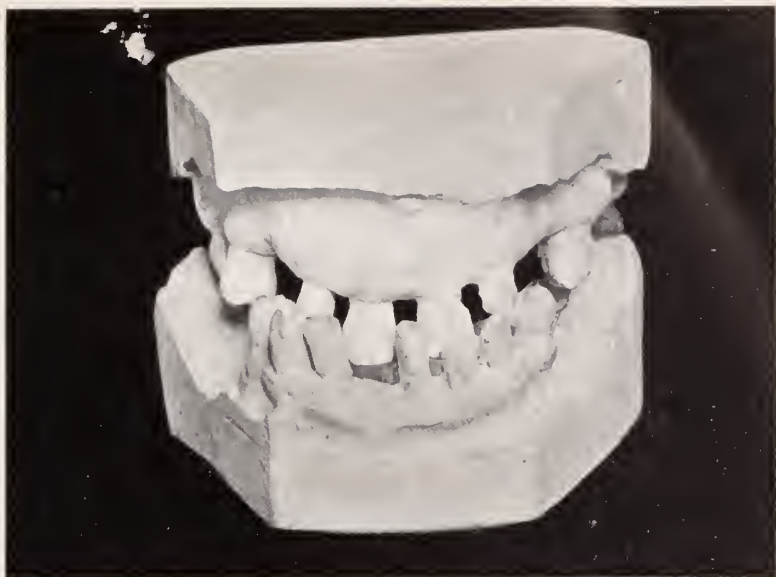


FIG. 1

Front view of a badly mutilated case before treatment.



FIG. 2

Side view of same case before treatment.

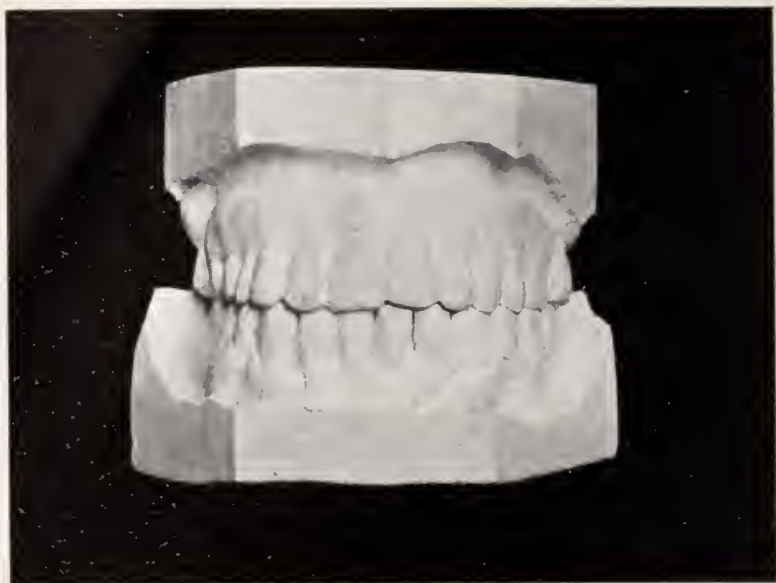


FIG. 3

Front view of the same case after treatment.

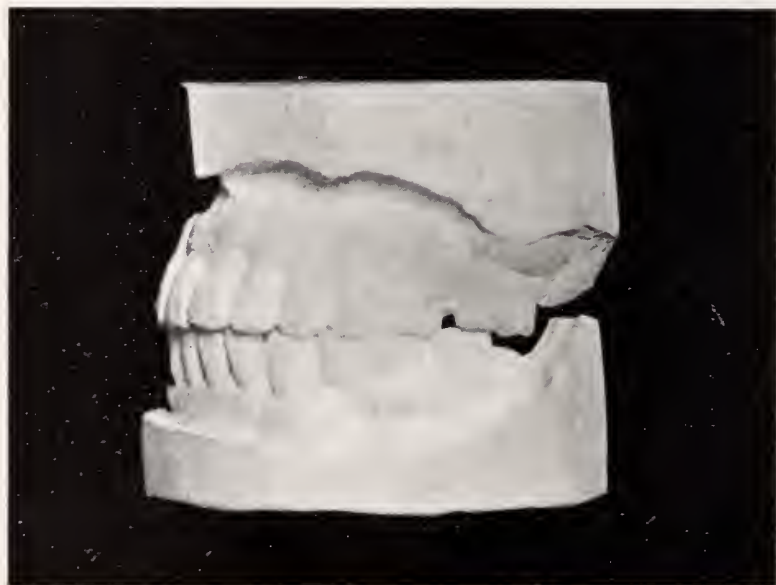


FIG. 4

Side view of the case after treatment.

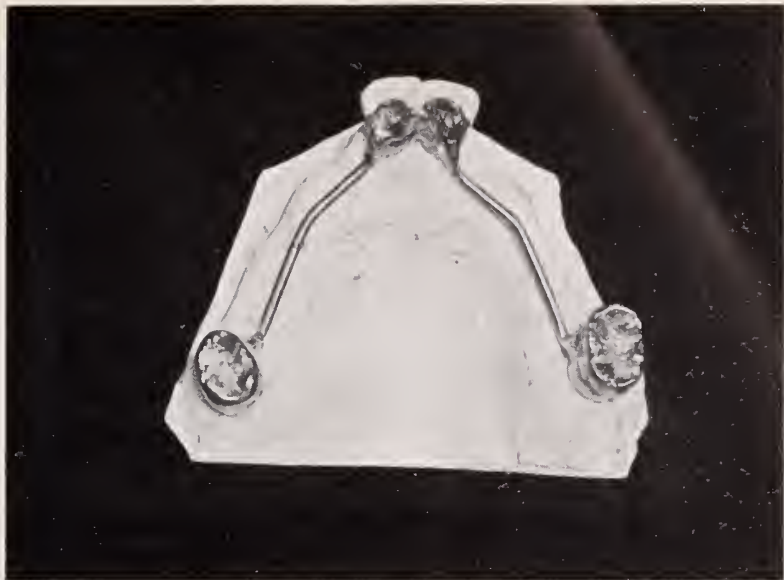


FIG. 5

View of cast of upper after all teeth excepting centrals and one molar on each side had been removed and the two centrals drawn together at the median line.

This cut also shows gold crowns on molars and cast gold inlays with dowels in centrals. The two inlays in the centrals are soldered together and the crowns are united in the inlays by 14-gauge iridio-platinum wire, thus making a framework which is cemented into place.



FIG. 6

Shows another view of the framework, together with a partial upper rubber denture in which four Gilmore attachments are plainly shown, two on either side.

The Gilmore attachments spring over the iridio-platinum bars and hold the denture firmly and comfortably in place.



FIG. 7

View of cast showing lower jaw after removal of all the teeth except two cuspids and two bicuspid.

The cuspid roots were crowned and upon the roots of the bicuspid copings with dowels were made and to the copings little extension bars or angle bars were soldered to receive the Gilmore attachments. Construction of lower denture was along the same lines as that of the upper.

tooth. However, the encircling clasp may be selected as the prototype of all tenso-frictional methods, so that whatever merit more recent methods of anchorage may possess, they should be credited to a process of evolution. When fixed bridge work was introduced, it was heralded as the *ne plus ultra* in the line of restoration methods. Within certain limitations it should still be so considered.

However, since no one prescription will answer for all human ills, so no one method or system of supplying substitutes for lost organs of mastication will meet the requirements of the dental surgeon.

Fixed bridge work is daily being prescribed and inserted in the mouths of confiding patients to whom it will, in time, prove to be like the wooden horse of Troy, viz., a vehicle for the introduction of undesirable visitors, in the shape of pathogenic bacteria.

In deciding upon a method for a given case, the hygienic standpoint is not the only angle from which the undertaking is to be viewed. The physiological effect demands almost equal consideration, so that the tooth, teeth, or root to which our retentive force is applied shall not be overtaxed.

It is not necessary to go into detail concerning the microscopic anatomy of the tissues surrounding a natural tooth. It is sufficient to recall that the peridental membrane is composed of inelastic fibers, methodically arranged, and distributed in such manner as to afford resistance to stress in all directions.

About the constricted part or neck of the tooth they are at right angles with the long axis of the tooth, reaching laterally, blending with gum tissue, which is also fibrous.

It is interesting to note that the sustaining fibers located at the alveolar margin are at right angles to the tooth and attached to the alveolus. At points nearest the cementum, additional reinforcement is gained by those fibers that pass over to form attachment with the outer surface of the alveolar border. This right angle arrangement of the fibers, properly called the dental ligament, offers the best possible scheme to prevent or resist lateral strain. Within the alveolus we find the same distribution for perhaps the first or occlusal third. From this point to the apex they

radiate obliquely and offer resistance to depressing or occlusal stress, virtually suspending the tooth in its socket. This accounts, in a measure, for difficulty encountered when we undertake to depress a tooth in its socket. The orthodontist will agree with me in tabulating tooth movements as being most difficult to accomplish in the following order, viz.: Depressing, rotating, elevating in its socket, labial or lingual movements. Now, if we consider the histology of these tissues, and recall clinical experience, may we not be justified in adopting a method of anchorage that contemplates ability to resist strain along lines that are least vulnerable?

Dr. G. V. Black demonstrated years ago, by systematic experiment, that a vigorous use of the teeth in masticating, together with well conducted prophylactic methods, had a tendency to bring an otherwise lame tooth, barely able to withstand a bite pressure of 40 or 50 lbs., to a condition of efficiency that enabled its owner to exert a force of 170 lbs., illustrating beyond cavil that enforced pressure on the supporting fibers of a tooth cannot but have a salutary effect, provided, of course, that the force comes from an angle contemplated by nature.

I am not presuming that the foregoing remarks present anything with which you are not all familiar. I simply offer them as preliminary to an explanation and illustrations of a system of anchorage and retention for dentures that, under favorable conditions, may be listed as a practical mechanical method of replacing organs that have been lost through the ravages of caries, trauma, and adverse pathological conditions in general. In view of the fact that the alveolar ridge is called upon to bear a part of the burden of supporting the artificial substitute, the method may be called a transition from bridge to plate prosthesis. There is nothing new or novel connected with employing a natural tooth or root as an anchor for artificial teeth, and at the same time afford the wearer an opportunity to remove and replace the denture. In fact, within the past decade a number of such methods have been exploited, all of them possessing merit, but limited in a measure to conditions; and while the systems provide for employment of the ridge as a support, the element of crown leverage over the root is not sufficiently eliminated. Then, too, if the patient is so unfortunate as to have nothing left in the

shape of a natural tooth, but one or two roots, it was impossible to use them without resorting to an artificial crown, with its inevitable lever action, over the root, while the method under consideration enables the operator to avail himself (to the intense comfort and gratification of his patient) of even one root to act as an anchor, no matter what its location may be, in either the maxilla or mandible. A pleasing esthetic effect accompanies the employment of a root or roots, in this, that the retaining mechanism is entirely concealed by the denture, and not even accessible to the tongue or sense of touch by the patient. When the angle bar is attached to a shell crown or porcelain crown with metallic base, the question has arisen as to the probable effect the lever action of the bar might have on the tooth.

Replying to this, I may say that I have no data on the subject covering a period longer than eight years. However, conditions in these cases were so satisfactory that I am led to believe we are justified in adopting the method in all cases where its application is indicated, because I am convinced by clinical experience that the question of injurious results is a negligible one, so far as the lever action of the angle bar is concerned. It must be conceded that in a distal extension, involving the second bicuspid and first and second molars, if shrinkage of the ridge takes place, pressure will accumulate on the bar, with resultant movement of the anchor tooth to accommodate itself to changed conditions, and from a mechanical point of reasoning, should throw the tooth out of its normal perpendicular. To eliminate guesswork and arrive at satisfactory conclusions along this line, the late Dr. John E. Byram found, by laboratory experiment, that if an extension, such as the one above mentioned, settled one-eighth of an inch at its distal extremity, the axial line of the anchor tooth would only be compelled to yield one-sixty-fourth of an inch from normal. Now, if the orthodontist is to be congratulated on performing extensive tooth movements, the general practitioner should, as Dr. C. E. Mills says, "be immune to criticism for causing this limited change of position, unaccompanied by any injurious results."

The lateral stress against the bar is minimized by the adaptation of the denture to the remaining teeth and uneven surfaces of

the ridge, so that, taking it all in all, your essayist feels safe in saying to brother practitioners that, from his own experience and that of others, we may, with propriety, offer the adjustable attachment method to our patients.

It goes without saying that the practicability of the application, and the indication for the employment of the method, can only be determined through a careful consideration of the physiological conditions manifested in each case.

The dental profession is in the limelight at this time, in the matter of operative procedures. Certain members of the medical profession have epitomized our extensive fixed replacements as unsanitary, alleging that we have created inaccessible pockets and hiding places that defy the most strenuous efforts on the part of the patient to comply with the rules of oral hygiene. We are loath to admit the truth of the allegation, and still conscious of the fact that in many cases we have slim grounds for defense.

PREVENTIVE DENTISTRY¹

BY HENRY A. KELLEY, D.M.D., Portland, Maine.

The invitation I received from your committee was to the effect that I read a paper before your Society upon the subject of prophylaxis, which has come, quite generally, to mean a certain type of cleaning of the mouth, including the teeth. It so happens that very many papers have been written upon prophylaxis, as above defined, including some by myself. In fact, this subject is so old a story that I replied to the invitation that I thought you would not be interested in what could be but a repetition of the best of my former papers upon this subject. Your committee repeated this invitation and said that, however old this subject was to me, it was evident, from many occurrences, that the profession, as a whole, did not know prophylaxis as it should, and it was their desire to keep the subject before your Society.

You will recall the true definition of prophylaxis is "preservative or preventive treatment," and while it has come to mean in dentistry a more or less definite system of cleaning, still any treatment that preserves the teeth or prevents their decay is prophylactic. The part of my subject which has to do with the mechanical cleaning of the teeth by instruments and sprays I will, if you please, omit from this paper. It is to be my pleasure to give a demonstration of this prophylactic treatment, as used in my practice, among your other clinics and I will be happy at that time to go over any part of this with any of you that are interested but uninstructed. In thus briefly dismissing this part of my subject, I would not have you think I consider it unimportant or uninteresting. It is simply that I intend to cover it in my clinic and that I wish in this paper to carry you *beyond* this mechanical treatment in our endeavor to prevent the decay of the teeth.

Several important things have quite recently occurred

¹Read at the 49th annual meeting of the Massachusetts Dental Society, Boston, Mass., May 8-10, 1913

that give much promise to those of us who look for the time when we shall prevent decay of the teeth. Perhaps these things, aside from the education of the public, come directly and indirectly from the various studies of the saliva. Again I must inform you that the consideration of the saliva and its component parts, the action of each constituent and all that, important as it is, must have but a small part in this paper. And that is so because, first, it is so deep a subject that it must be *studied*, and what I could say to you here would make but little impression. The men who have made this study have written of their findings and experiments, and their articles are in your journals for your study—articles written by such men as H. Carleton Smith, Percy Howe, H. C. Ferris, F. W. Low, J. W. Beach, W. J. Gies, A. P. Lothrop, R. W. Bunting, and others. And, again, you have listened to men far more able to enlighten you upon the study of the saliva and its constituents than myself, Drs. H. Carleton Smith and Percy Howe especially. It seems to me that it was out of this study of the saliva that we were carried onward to a very general consideration of all the conditions that effect the decay of the teeth. That is, as soon as we stepped *off* the decaying tooth to seek the cause of that decay, we stepped *into* the whole realm of the physiology of the human body.

It so happens that three very distinctive investigations of the cause of decay have been going on in the past few years, investigations that promise us that the future may see dentists able to *prevent* the decay of the teeth. I refer to the work of Prof. William J. Gies, of the Laboratory of Biological Chemistry of Columbia University, and his assistants (a work in which H. Carleton Smith, of Harvard University Dental School, has had a part); to the work of Dr. J. Sim Wallace, Dental Surgeon and Lecturer on Dental Surgery and Pathology, London (Eng.) Hospital, and to that of Dr. H. P. Pickerill, Professor in the Dental School of the University of Otago, New Zealand.

It is noteworthy that these three men, in widely separated cities and very largely, if not entirely, in ignorance of the work of each other, have arrived at conclusions so remarkably in accord, and that both Wallace and Pickerill write in no uncertain tone as to a belief that dental caries can be prevented.

Wallace says: "Dental caries is one of the most easily and certainly preventable of diseases, and there would seem now to be no valid excuse for the bringing up of children with decayed teeth. . . . Unfortunately, so far it is only those who have become interested in the subject and who are themselves possessed of the required knowledge to come to correct conclusions on the subject, who know the simple secrets of prevention."

And Pickerill says he "is convinced that, by the means and methods subsequently to be described, not only may the occurrence of caries be prevented, but in some cases actually cured."

In the face of such statements, should we not rejoice and feel that the age of preventive dentistry is about to be ushered in, if it has not already dawned?

To show you how well these statements are supported with seeming proof and to instruct you in the methods advocated is my object in writing this paper.

If we go back to primitive man and come down through the ages to modern man, we will see that in all this time the endeavor to clean the mouth and teeth has changed but little in theory. Very early in the life of man it seems to have been known that certain foods left upon the teeth caused them to decay, and they used certain tooth powders, brushes and mouth washes to try to prevent this decay, much as most of those who try to prevent decay of the teeth use them to-day. Also, very many years ago it was known that acid substances were in some way unfavorably connected with this decay.

This seemed to give a very easily solved problem, namely, that the way to overcome an undesirable acid condition was by neutralization with an alkali. And so was built up the use of alkaline tooth powders and mouth washes.

In a report to the New York Institute of Stomatology, May 3, 1910, by Alfred P. Lothrop and William J. Gies, it is stated: "The foregoing facts are responsible for our suggestion to Dr. J. Morgan Howe that diluted vinegar or common fruit acids—*acid media ordinarily present in food*—may be very helpful agents in the removal of mucinous masses from the teeth, especially if applied with a suitable instrument. It is probable that the cleansing effect of such treatment would be less harmful to

the teeth than the frictional operations now in use for similar purposes." There, in a few words, is the mention of the theory that is, we hope, to lead us on to preventive dentistry.

While Pickerill has been engaged in his study for nearly six years, it was not until 1912 that he published his results, because, he says: "It was further decided to publish nothing until the chain of evidence was more or less complete." Therefore the publication of Gies' theory antedates the publication of Pickerill's work.

Gies is, however, amply supported both by Pickerill and Wallace.

And now, in order to keep my paper within bounds, let me say this: It is the consensus of opinion that the way to produce this acid condition, after eating, is by a prescribed diet, though Gies, as quoted, suggested an acid mouth wash and Pickerill also uses one. Gies and his assistants seem to have devoted their researches more definitely to the study of the saliva alone, and adhering to my intention, as defined earlier in my paper, to leave this subject to you for *study*, I will not consume much time in a consideration of their work.

Pickerill has gone pretty well over the whole field of preventive dentistry, and both of these men and their work will be used to back up the position of Wallace, to which I wish especially to direct you.

This I do because the subject I wish especially to bring to your attention is the diet, as influencing the decay of the teeth, and the possibility of so influencing and modifying that diet as to make it preventive of dental decay, thus opening the way to a return to the time in the life of man when the percentage of decay was even less than ten per cent., against the more than ninety per cent. of to-day. Of course I recognize that diet alone is not the sole cause of this vast increase of dental caries, but it just happens to be one of the causes, and a very large one, that it is possible we can control.

Other influences, to which I cannot in the time allotted do more than just mention, are the excessive brain work (compared with the muscular), with the resulting indoor life (compared with the outdoor life); the shape of the teeth *themselves*, as well

as their arrangement in the jaws (including the shape and size of the jaws themselves), the structural defects of the teeth, the effect of foods upon the *necessity* of mastication and the effect this mastication, if demanded, has upon the size and shape of the jaws, and how this influences the breathing apparatus, and thus the vital force as well as the regularity of the teeth. All this must be passed over.

Miller established, we think beyond question, that in order to induce caries it was first necessary to dissolve out the lime salts of the enamel by the action of an acid, followed by the peptonizing action of the bacteria, the acids being formed from the fermentation of carbohydrate food. Hence, all this endeavor to create an alkaline condition of the mouth and to remove from the enamel these fermentable carbohydrates. We who have been engaged in this endeavor and have watched the results, know that the results have been unsatisfactory.

J. R. Mummery gives the percentage of skulls with carious teeth in primitive man as follows:

Esquimaux	1.4
Maoris	3.0
Indians of N. W. American Coast.....	3.9
Fiji Islanders.....	5.2
Northern Hindoos.....	5.9
N. American Indians.....	9.5
Eastern Polynesians.....	11.4
Southern Hindoos.....	14.0
Zulus	14.2
Sandwich Islanders.....	19.0
Australians	20.5
Bushmen	20.6
Negroes (Slaves.).....	20.8

Of course this table is open to modification and is not to be considered as exactly representing the percentage of caries present in each race, but it is sufficiently accurate to compare with our percentage of caries in modern, civilized man, which may be stated roughly as about 90 per cent.

I could give you figures to show how civilization of uncivilized man has raised this percentage of dental caries, but the inference is plain.

It is evident there is a distant relationship between the amount of caries and the state of civilization which it seems to me is quite the same as saying that our diet and mode of living is the cause of our extensive decay.

Now, if we examine the food we eat and the way we eat it, we will find some very interesting things. First, Wallace found that foods could be divided into two classes—those which tend to leave viscous and fermentable carbohydrates about the teeth, and, second, those which tend to brush them away.

A breakfast, luncheon and supper such as would *not* tend to produce decay is given by Wallace, as follows:

Breakfast—Fish, bacon, toast and butter, coffee and tea.

Luncheon—Meat or poultry, potatoes, salad, baked bread, pudding, fresh fruit, water.

Supper—Rusks, toast or bread rolls and butter, chicken or fish, an apple, tea or coffee.

And over against this he places a diet which *induces* decay, as follows:

Breakfast—Porridge and milk, bread and marmalade. Then perhaps a few hours after a glass of milk and a sweet biscuit (cracker).

Luncheon—Mashed potatoes and gravy or minced meat, milk and pudding.

Supper—Bread soaked in milk, or bread and jam, cocoa and cake, and a supplementary supper on going to bed of a glass of milk and a biscuit or just “a tiny piece of chocolate.”

On comparing these two different types of diet, we observe one is of a kind which stimulates mastication and the last thing taken leaves the mouth clean, or at least free from carbohydrates, so that even when soft food is part of the meal the mouth will be physiologically clean at the end of the meal.

The other type is intended to represent the kind of meal which is calculated to lodge about the teeth and to ruin them within a few years, by making efficient mastication and the self-cleansing of the mouth practically impossible, and by leaving the mouth sticky with fermentable carbohydrates and a virulent crop of acid, forming micro-organisms which have had their development encouraged by the previous meal.

As confirming these recommendations of Wallace, I would submit the following from Pickerill:

Two grammes of each of the substances in the following table were mixed by trituration in a mortar with pestle with 10 c.c. of distilled water, sterilized, infected with 0.2 c.c. of mixed saliva, and incubated for four days. At the end of this time the acid was estimated with the results shown in the table.

Food Material. Table I.	Acid Units c.c. of $\frac{N}{5}$ NaOH.	Percentage of Carbohydrates. Hutchinson.
Chocolate	5.10	57.3
Malted milk (dry)	4.90	70.0
Pastry	4.10	60.0
Toast	2.40	51. +
Parsnip	2.38	14.0
Cake	2.28	
Brown bread	2.25	48.0 (about)
Nuts	2.16	8.5 "
Date	2.00	65.7
White bread	1.87	51.5
Milk	1.76	4.5
Biscuit (plain)	1.65	75.0
Cabbage	1.50	5.8
Potato	1.40	19.0
Fig	1.30	62.8
Apple	1.21	12.5
Onion	0.60	6.3
Carrot	0.35	10.0
Apple jam	0.30	
Raspberry jam	0.25	50.0 (about)
Sugar (cane, lump)	0.24	100.0 "
	$\frac{N}{5}$ H ₂ SO ₄	
Fat	— 0.40	
Ham	— 2.45	
Beef	— 2.80	

It is seen that all the carbohydrates form some acid, but that there are great differences in the amount formed. For instance, from chocolate is formed more than twenty times as much acid as from cane sugar, and from parsnips twice as much as from apple.

As seen from the second column, these differences do not in the least correspond with the amount of carbohydrates present in

each, but rather it depends upon the kind of carbohydrate and its state of comminution.

It is, too, a very significant fact that all those substances from which the least acid is produced are the most tasty substances, and the majority of them (cabbage, potato, apple, onion, carrot, apple and raspberry jam) are originally acid in reaction. The only materials which gave an alkaline reaction were the proteins—beef, ham and fat.

The question which now arises is: Can we by a combination or sequence of salivary depressants and excitants reduce the fermentable *débris* remaining in the mouth after a meal?

Effect of sequence—Substances which were known to produce most acid were eaten and then followed immediately by other substances which had been shown to result in an alkaline reaction. The teeth were then brushed and the mouth rinsed and the washings incubated, with the following results:

Substance.	Alkaline Units.
Bread and butter followed by apple.....	Neutral
Bread and butter followed by orange.....	Neutral
Bread followed by radish	0.15 (alkaline)
Bread followed by fish	0.03 (alkaline)
Bread followed by duck	0.10 (alkaline)
Rice followed by orange.....	0.20 (alkaline)
Chocolate followed by apple.....	0.20 (alkaline)
Cake followed by orange.....	0.15 (alkaline)

Here, then, is an important fact, that by such a sequence the deleterious effects of acid-forming substances can be completely overcome and an acid result transformed into a neutral or alkaline one. This, obviously, is of the utmost importance as a physiological means for the prevention of caries, and offers a most simple and efficacious method whereby *the commencement of the process of decay may be obviated*.

A mixture of these substances, while showing a like result, was not nearly so efficacious as the *sequence*.

Therefore, to prevent the retention of fermentable carbohydrates on and between the teeth, and so eliminate or very considerably reduce the carbohydrate factor in the production of decay, starches and sugars should on no account ever be eaten alone, but should in all cases either be combined with a substance

having a distinctly acid taste, or they should be followed by such substances as have been shown to have an "alkaline potential," and the best of these are, undoubtedly, the natural organic acids found in fruits and vegetables.

Next, it was observed by Wallace that whenever a set of teeth were seen in which the amount of decay was but little, that one of two things was true. Either the person did not eat the foods that tend to leave viscous and fermentable carbohydrates about the teeth, or if these foods are eaten the meal is finished with the foods that tended to brush them away. This we would call the mechanical cleaning of the teeth by the action of mastication.

But, of course, there is much more to it than that. After this arrangement of the food so that at least the last article of the meal is detergent, we will consider what part the saliva plays in this prevention of decay. The much discussed question of the sulphocyanate of potassium and its ability to retard or prevent decay I must not consider. It is rather to consider the *cleansing properties* of the saliva and not its antiseptic properties, if such it has, that I desire, as we believe it is the fermenting carbohydrates *held for long periods* against the enamel that cause the enamel to break down and allow decay to commence.

If we could have our saliva as we desire, we would choose to have first enough in amount to act as a wash to dissolve and float off from the teeth food particles capable of dissolution and removal in this way. Second, to be alkaline enough to overcome the acids of the mouth, either introduced as acids or the acids formed by the decomposition of foods.

I must exclude the questions of amount of ptyaline, sulphocyanate of potassium phosphate, chlorides, etc., and their effects.

Can the diet influence these two conditions, the amount and the alkalinity of the saliva? Most certainly.

Pickerill says: "It is evident that the rate of flow must be extremely important in considering the mechanical cleansing of the mouth and teeth by the water of the saliva alone, and the dilution of the acids formed by fermentation. The greater the flow per minute, the more rapidly will the acids be carried away. It is always a question of time. The organisms form a certain

amount of acid from carbohydrate in a certain time, and it is a question whether the saliva can dissolve and carry away the carbohydrate debris or neutralize those acids as they are formed, or whether the acid production gets ahead of the saliva and so free to combine with the lime salts of the enamel."

The amount of saliva can be stimulated or depressed. The stimulants are stimuli conveyed via the optic, olfactory or auditory nerves. Of foods, the most tasteful substances, and especially if they are acid as well as tasty—i. e., orange, apple, carrot (raw), figs, stewed apple and lemon. Among the salivary depressants are soft and little flavored foods and tannic acid (tea). Sodium carbonate shows a markedly depressant effect, and chalk, soap and carbonate of soda used with the tooth brush caused a lowering of the c.c. per minute from the normal 1.65 to 1.00, while the use of acid potassium tartrate (powder) showed an increase in c.c. per minute from normal 1.65 to 1.90.

We thus see the amount of the saliva is very important and is completely under control *as to amount*.

Alkalinity—The most *acid* substances produce the greatest alkalinity. As compared with neutral substances, they are as 11 : 1. Orange, apple, pineapple, celery, carrot and lemon are foods which markedly raise the alkalinity of the saliva.

Thus we see that the acid forms of food are the ones that increase the amount of saliva and likewise increase the alkalinity of the saliva. *Depressors* of alkalinity are sweet substances—chocolate, cake, grapes, bananas, figs, etc., bread and butter, brown bread, meat and biscuit (crackers).

This increase of alkalinity of the saliva by the use of an acid diet seems at first as paradoxical, but a little consideration, supported by experiment, proves it *true*. If we take a mouth that is neutral or slightly acid and wash it out with a quite strongly alkaline substance (mouth wash) it will, of course, show at once a marked increase of alkalinity, but unfortunately this increase of alkalinity is very fleeting, and in a very few minutes—two or three—the saliva will return to normal and most often to subnormal alkalinity. It is most probable that a constant use of an alkaline mouth wash will in time cause a permanent loss both in alkalinity and totality of saliva. (Pickerill's experiments

prove this to be so.) And this is the very thing we have been doing with our tooth powders and mouth washes.

Table VI.—Pickerill.

Total Saliva Five Minutes After Use of Dentifrices.			
Substances Used as Dentifrice.	C.c per Minute.	Alkalinity per c.c.	Alkalinity per Minute.
Normal saliva (resting) to show increase or decrease.....	1.65	1.05	1.73
Chalk, soap and carbonate of soda with tooth brush.....	1.00	0.90	0.90
The same used with finger traces remaining in mouth.....	1.10	1.30	1.43
Chalk, carbonate of soda, cloves and gaultheria	1.30	1.00	1.30
Acid potassium tartrate (powder).....	1.90	1.20	2.28

We cannot but conclude from this that the use of alkaline dentifrices for the prevention of caries is wrong, is physiologically incorrect, unscientific, and empirical; and not only so, but also actually conducive to the inception and progress of disease, by decreasing the circulation and alkalinity of fluids in the mouth.

The use of alkalis seems to be based upon a wrong conception. It is as though it were thought that lactic acid developed and accumulated in the mouth, remaining there for some hours, or until next morning, when an overwhelmingly strong alkali is introduced to neutralize it; whereas, of course, as each molecule of lactic acid is formed, it searches for something wherewith to combine. Alkaline salts of the saliva will obviously most readily satisfy it, but should these not be available, then the calcium phosphates and carbonates of the enamel surface are utilized.

It cannot be too clearly recognized that, by the use of alkalis, only those molecules of acid formed immediately previously can be neutralized, and also that the natural defensive forces of the mouth are thereby lowered for some considerable time afterwards.

On the other hand, if a weak solution of a fruit acid, the vinegar of Gies or the citric or tartaric acids of Pickerill, or the fruits themselves as recommended in the diet by Wallace, be used, of course there is at once a marked increase in the acidity

of the saliva, but this gives way to a *marked* increase in the alkalinity in two or three minutes and this alkalinity lasts at least for fifteen minutes.

It is only when an acid remains upon the tooth, unneutralized and unsatisfied, for a long period, that harm is done. There is, therefore, no expectation or evidence that this weak fruit acid can or will do harm, nor should there be any expectation that an alkaline reaction lasting two or three minutes, as from the alkaline mouth washes and tooth powders, will be efficacious in overcoming the formation of acids of decomposing foods.

The acids to us in this treatment must be strong enough to *stimulate* the mechanism controlling salivary secretion and yet not so strong as to defeat the desired end. Pickerill suggests tartaric acid as per formula:

R

Potass tart ac.....	gr. ii
Ac tartarici.....	gr. i
Ol limonis.....	m. iii
Glusidi	gr. $\frac{1}{4}$
Aqua	ad. $\frac{3}{4}$

I do not see how I could better present this to you than this quotation from Pickerill:

"1. It is evident the saliva is a fluid extremely variable in its composition and amount, but that these variations do not occur without reason, but rather in obedience to fixed and definite laws and in response to certain ascertainable stimuli.

"2. The mechanism controlling salivary secretion is extremely sensitive and complex, since different 'flavors' of little intensity are capable of being 'selected' and give rise to secretions of saliva differing widely in character and amount.

"3. That practically all the normal constituents of saliva are, if present in sufficient amount, of value and importance in protecting the teeth against the occurrence of dental caries, and in maintaining the health of the oral mucous membrane.

"4. That *acids*, and particularly the 'natural' organic acids, are stimulants which excite the greatest amount of these protective substances per minute, and, moreover, give rise immediately, and for a considerable time afterwards, to an increased

alkalinity of the mouth. That, conversely, substances of little or no distinctive 'flavor,' and also alkalies, produce a diminution in the amount of protective substances per minute, and reduce the alkalinity of the mouth both at once and for some time afterwards.

"5. That in the saliva is provided a natural and potentially perfect mouth wash acting continuously day and night (not merely for a few minutes a day). THAT IT IS, MOREOVER, COMPLETELY UNDER CONTROL; THAT IT MAY BE ALTERED OR VARIED IN AMOUNT OR COMPOSITION; THAT ITS BENEFICIAL EFFECTS MAY BE INCREASED OR DECREASED ABSOLUTELY AT WILL."

We have thus seen something of what we would like to do and that there is strong probability we can do it. Should I not say there is *proof*, for what else mean these words quoted above of Pickerill and Wallace, words uttered in no uncertain tone?

If these observations be correct, then it should be possible to so develop a child that it should be quite free from dental caries.

Wallace says: "It now only remains to bring forward even more startling evidence, and to make it more obvious to those who did not or would not take the trouble to follow the facts and arguments which demonstrate the truth of the theory. It appeared to me the most satisfactory way of doing this would be to get people with infant children to put the theory into practice. Fourteen children have been subjected to the test, and at ages ranging from five to seven years their teeth were examined, with the result that not one tooth of any of these children showed the slightest trace of caries. This may not seem a large number, but when we remember that in England a similar number of children of the same class would certainly have had eighty or ninety carious teeth among them at the same age, we see that according even to this alone there is overwhelming probability or practical proof that the theory is correct."

PRESIDENT'S ADDRESS¹

BY MICHAEL W. FLYNN, D.D.S., SPRINGFIELD, MASS.

Members of the Massachusetts Dental Society, Ladies and Gentlemen:

The honorable position in which I find myself to-day is due not to any special or general fitness that I may have for the position. It is given to me through the fairness of the members from the eastern part of the State, who are active in the organization, in order to give the extreme western part of the State recognition and to encourage the district societies. It is true that I have been associated with this Society for a number of years, but have never had an opportunity to do certain work or assist the organization as many others have done. In behalf of my own district and also for myself personally, I wish to thank the members of the Society for this honor which has come to me.

I regret that I am not an apt writer and also that I have but limited ability as an educator, and for these reasons I am not going to enter extensively into a discussion of these subjects. I am simply going to point out for your consideration a few thoughts and ideas which have come to me because of the position I have occupied for the last year. Their worth and fulfilment will depend on the action of my hearers.

The first matter that I wish to call to your attention, and one which I regard as very serious, is the lack of due consideration and feeling which exists between the Board of Registration in Dentistry and the State Society, a condition which to my mind is having a very bad influence upon the dental profession throughout the entire State. This lack of harmony between these two bodies has had a tendency to increase the number of non-registered dentists throughout the State.

The Board of Registration in Dentistry in former years took an active interest in the suppression of illegal practice, and at present because of the lack of funds—or some other good rea-

¹ Read at the annual meeting of the Massachusetts Dental Society, Boston, Mass., May 8-10, 1913.

son—has lost all interest in this work. It occurs to me that the time has arrived when this Society must take an active position on this question, and many of our young practitioners refuse to affiliate themselves with our Society because of the claim that we do nothing to protect their interests.

At a meeting of this Society some two or three years ago it was voted to dispense with the committee who submitted to the Governor a list of names of practitioners suitable to hold the position of examiner on the Board of Registration. At the time this was done I was opposed to the idea, and as time has gone on I am more opposed to it. I am going to recommend that said committee be re-established, principally for the reason that I believe our not having this committee has opened up a field for more political work in regard to these positions than has ever existed before. We have relinquished the right of our Society to suggest any names to the Governor for this important position, and have left the field open and the way clear for those who are anxious to resort to politics to bring about these appointments. True, when we had such a committee in existence it was indeed very discouraging, for time and time again the recommendations of our committee were utterly ignored by the Governor, and those who possessed the political power were able and did succeed in securing other candidates for the position. But aside from all this, there is a principle involved for which we should not hesitate to make a sacrifice, even though formerly we have met with defeat.

Another matter to which I wish to call your attention is a change in the constitution and by-laws that will permit the district societies outside the Metropolitan district to retain \$2 from the annual membership dues, to be kept by the local society for the purpose of paying local expenses. I offer this recommendation feeling that the districts outside the metropolitan district are so far away from the actual educational work of dentistry that, in order to receive all the benefits of the State Society, they must have this additional money for the purpose of getting talent in their respective districts for the improvement of their own members. The Metropolitan district is the only one which has a very large membership, and owing to the lack

of funds in the other districts, it becomes a heavy burden for them to acquire talent sufficient to make their meetings of interest and worth during the year.

I want to renew the suggestion which was made by Dr. Smith last year, that the Society adopt some method for the purpose of increasing the membership of this Society. We have in the State to-day nearly 2,500 registered dentists, with less than 1,000 of them members of this Society. The money received from such memberships could be used advantageously by the Society in certain lines of research work. But, aside from this, it appears to me that the men induced to join our ranks would be greatly benefitted by so doing.

Another recommendation I wish to make is that it shall be the duty of the President of this Society to visit each district society at least once during his term of office, and if for any reason he is unable to do so, he shall call upon the Secretary to make this visit. The expense of these visits should be borne by the State Society.

The establishing of a lecture bureau is another matter which was called to your attention last year, and if this bureau has not been placed upon a sound working basis I strongly recommend that it be taken up at this session and given careful consideration. During the year I had occasion to invite someone to visit my own district, but did not know of any official source from whence to obtain the information.

One great topic which will perhaps interest the dentists of the State more than any other to-day is the question of the dental nurse. While many of our able dentists are greatly opposed to the proposition, others—of equal ability—look upon it with favor. I heartily commend the work of Dr. Cooke and others who are more closely associated with this work, and although I have not had the opportunity to do the work I desired in this connection, yet I wish to say that I am heartily in favor of the dental nurse act and recommend that the Society continue the effort until our work is crowned with success.

The question of the JOURNAL is one which has received much attention from this Society in years gone by and at present is in a somewhat unsettled condition, many of our members

feeling that the undertaking is too expensive for us to carry. A delegation of Massachusetts dentists, many of them active members of this Society, during the past year were in New York in conference with men interested in the project there, and later on I am going to ask them to make a report to the Society.

I want to publicly express my thanks to Dr. Fones, of Bridgeport, Connecticut, who at a great sacrifice of time entertained a large number of dentists, members of this Society, at his office in Bridgeport, devoting his entire day, and also the time of his assistants, giving clinics every fifteen minutes from 10 A.M. to 3 P.M. on prophylactic dentistry.

In conclusion, I wish to express my warmest appreciation of the gentlemen who were associated with me as Secretary and Executive Committee. It was indeed a great pleasure to be associated with men who were so eager to assist in performing the duties of their respective positions. I wish further to say that if it were not for their assistance and advice my efforts would have amounted to naught.

PROFESSIONAL JOURNALISM¹

BY WILLIAM B. DUNNING, D.D.S., NEW YORK CITY

The literature of any science may be compared to the soil from which a tree grows. As this source of nutriment is deep and rich, or thin and poor, the tree is luxuriant or spindling; and a given department of human endeavor will show progress or decadence in proportion to the extent and quality of the recorded special knowledge which may exist. The soil of the tree is compounded of substances which made sturdy timber in past ages, now sunk in decay—yet rising again in the very sap of the new generation. The wisdom of to-day is the vitalized knowledge of yesterday bequeathed us by the “humble dead”—recorded laboriously and often painfully, which now we use arranged into new combinations for purposes beyond their modest dreams.

If we project our own work into the needs of the future, we may rest assured that certain of our endeavors still live, though in forms we little guess, and although our names are forgotten.

So the value of records can only be measured by the advances of mankind since the advent of writing. Illiteracy and barbarism are co-eternal: man has advanced only where his thoughts and deeds have been recorded.

This preamble is intended, of course, to bring strongly to your attention the importance of good dental literature. Our work upon the human frame is of unquestioned importance; yet it must be stated with regret that the rank and file of our profession know little and care less concerning the character of our current literature. As an infant profession we were fed artificially, so to speak, by the predigested pabulum of the supply house journals. In justice to their proprietors, let us say frankly that our life was saved, though our digestion rendered delicate. We are now grown to years of discretion, and we need a stronger diet of our own preparation. The importance of this point is fundamental. We cannot aspire to be scientific men if our

¹ Read before the Metropolitan District of the Massachusetts Dental Society, Boston, March 31, 1913.

apathy is such that we leave the care of our writings to men whose only interest in dental science is the sale of their wares.

I am not inveighing against these men or companies: their position is perfectly understandable and, from their view, logical. They have commodities for sale; their rivals in trade have other commodities; someone has shown the superiority of a rival's preparation, appliance or machine, which information is of value to every practitioner. Will the reports and contributed articles of a given journal advise their readers of these facts and thus indicate the excellence of a rival's product? No trade journal, to our knowledge, has undertaken this form of suicide—and it is safe to assume that the interests of the house which publishes the journal will not suffer by its own hand. We should be highly unreasonable beings to suppose otherwise. We have no quarrel with the supply houses over their instinct for self-preservation. We have the same instinct, and, let us trust, sufficient vitality to make our position of independence of thought and opinion respectable in the eyes of all concerned.

Of course a very large portion of journal literature presented to us by the supply houses has no relation to their commercial welfare, and such material is printed as impartially by them as it could be by anyone; but that is beside the mark. Our whole contention at the moment concerns a principle underlying our professional manhood, and only by standing for principles shall dentistry be lifted above the bread and butter basis that so long has been its reproach.

So much for the contention that dental journalism is one of the proper functions of the dental profession itself—that the management of our leading publications should be within our own hands. We must now consider the business of producing such a journal.

The difficulty about any new enterprise is the need of money. When the average man feels the touch in his pocket he begins to consider whether, after all, the old cheap way is not better, since he has lived with it so long and so comfortably. He forgets that his action, based upon hasty consideration and personal inertia, and which seems to him unimportant one way or the other, becomes, when multiplied by the similar action of other average

men, the vote of the community. This action is not based upon the need of strict economy, for the same average man thinks nothing of paying from three to five dollars for a seat at a banquet—perhaps several times in the year—and he would promptly resent the insinuation that such dissipations were beyond his means. In fact, the average man lives in comparative comfort, and if he aspires to a modest touring car he is quite likely to have one before the season is out.

The explanation of his conduct is simply that of inertia—he is lazy about it, and does not care greatly what happens in a matter of such remote and general interest.

We must gain the attention and interest of this Average Man—for he is the person who is to decide the fate of professional journalism. If he stands back of our JOURNAL, and others of the same nature, to the extent of the cost of one good dinner a year, it will be possible for the dental profession to publish its own literature upon a substantial, dignified and thorough-going basis. Witness what has been done by the American Medical Association in producing the best medical journal in the world, and one which has become such a potent factor in the progress of general medicine. The campaign initiated by the American Medical Association twenty years ago, when they started with three thousand subscribers, if imitated now by our National Dental Association, would produce, it is reasonable to suppose, during the coming twenty years, a dental journal comparable in scope and influence to that of the American Medical Association. The whole thing depends upon concerted and determined action, and there are nearly fifty thousand dentists in this country.

The cry which we hear in complaint of professional dental journalism—that our JOURNAL, for instance, has such a limited subscription list, as compared with the more prominent supply house journals—is a difficulty which would promptly disappear as soon as a sufficient number of our associations combine in the support of a journal. It is a very simple problem in arithmetic. Our present narrow range of influence should be but a temporary difficulty—the correction of which, however, will call for some public spirit on the part of all concerned. As for commanding the best scientific and literary materials, that problem will be solved automatically with the growth of our circle of influence.

The missionary work required to advance this new movement falls heavily, at present, in the case of *THE JOURNAL OF THE ALLIED DENTAL SOCIETIES*, upon six societies, and, more particularly, upon a few individuals. The great need at this moment is the support of other associations. We want new members to enter our alliance. We should, if possible, get several of the State societies to join us, and it is to be hoped that the friends of professional journalism, here in New England and elsewhere, will vigorously use their influence in this worthy cause.

Our advertising department is a very valuable asset, but no professional journal worthy of the name should ever allow itself to become unduly dependent upon this source of income, for by so doing it would speedily become a trade journal in fact. So long as we may obtain advertisements from reputable dealers on a self-respecting basis, well and good; but it behooves us to increase the number of our readers as speedily as possible by adding more societies to our alliance, and when this is done, and the would-be advertiser is assured of a wide circle of readers, he will be glad enough to accept our terms, in order to appear in our pages.

One word with regard to the mechanical quality of our journal. Nothing but the best in the way of typography and other technical procedures will be successful in the long run. We must have good paper, good illustrations, accurate editorial work, and prompt publication and delivery. Our Average Man, who is so coy and whom we are so anxious to interest, is shrewd enough to guess that a given product is cheap or the work of amateurs, and we can in no way blame him for losing interest where the thing for which he pays lacks intrinsic excellence. Of course good typography and good illustrations mean an expensive magazine, but, on the other hand, a cheap performance means certain failure and speedy disrepute. Professional journalism in the past has gone over a rocky road, and frequently has failed because of inadequate means to produce something worth paying for.

In conclusion, I wish to reiterate and to urge upon you—first, the importance of good dental literature, produced under the control of our profession, and secondly, the entire feasibility of this proposition so soon as our rank and file appreciate that fact, and give their hearty and continued co-operation.

**SOME FACTS—CHEMICAL AND OTHERWISE—ABOUT
DENTIFRICES¹**

BY PROF. HOWARD C. KELLY, OF THE CENTRAL HIGH SCHOOL,
SPRINGFIELD, MASS.

The dentists of Massachusetts are said to be among the most skilful in the world. They ought to be—they have the most practice. I did not realize this fact until something over a year ago, when I was invited to present a paper of similar title to this one before the Valley Branch of your State Society. At that time I hesitated to accept, fearing that it would be taken as presumptuous, not to say impertinent, for a layman to pretend to instruct dentists on a matter so common and so very important to the profession. Rather to my surprise, I was told, in response, that the dentists of Springfield and vicinity were so busy—so really overwhelmed with work—that they had “no time to study up such things.” Several dentists whom I questioned corroborated this statement of the secretary.

Ladies and gentlemen, if this is true outside of Springfield, if the dentists of this commonwealth are so besieged with work, so overwhelmed, submerged and literally buried beneath a mass of decayed teeth that they cannot spare the time to put a little thought and energy into the prevention of diseased conditions, then I most heartily congratulate their pocketbooks, and suggest that a strong stimulant be applied to their common sense.

Are the dentists of Massachusetts more interested in disease than in health? Do they prefer to treat a diseased tooth rather than produce conditions which will render decay and suffering less common? Does their interest center in the cash they receive rather than in the aid they give? Are these things true? I dislike to believe it, but if so, it is certainly high time for a radical readjustment of our standards of value, and a new definition of the word “ethical.” Such a readjustment must come if the dental profession is to maintain the standing it de-

¹ Read at the annual meeting of the Massachusetts Dental Society, Boston, Mass., May 8-10, 1913.

sires and deserves among the thinking people of every community.

If, on the other hand, our inferences are not true, how can we account for the general ignorance which exists, even among dentists, concerning a subject which those same dentists tell us is of the highest importance? I leave the answer to you.

But does such ignorance really exist? For some years I have been questioning, without previous warning, the pupils in the entering class of the Central High School of Springfield, Massachusetts, regarding the tooth preparations which they use, and the answers received are, it seems to me, rather uncomfortably good evidence that we have not overstated the case. These pupils are fairly representative of all parts of the city, and every class has yielded almost exactly like results. From this I conclude that the results also are fairly representative of the average Massachusetts city. Take, for example, the results of this year's test.

The questions asked were four in number, and the following answers resulted:

1. *Do you use any sort of tooth preparation?*

Total number reporting.....	230
Not using any preparation.....	13 or 6%
<hr/>	
Using some preparation.....	217 or 94%

These answers are practically identical year after year. The number responding varies, but the percentage of each remains about the same. The use of some sort of tooth preparation seems to be practically universal.

2. *Is the preparation you use powder, paste or liquid?*

Paste	102 or 47%
Powder	96 or 44%
Liquid	19 or 9%
<hr/>	
217	

The powders and pastes seem to be about equally popular at the present time, but the results of several years indicate that the pastes, probably on account of their greater convenience, are making rapid gains. This year, for the first time, they have

passed the powders. The liquids, on the other hand, are just as steadily losing ground.

3. *What is the name of the preparation you use?*

Colgate's	73
Dr. Lyon's.....	15
Kolynos	13
Sanitol	12
Larkin's	8
Hydrogen peroxide.....	5
Miscellaneous	12
"I don't know".....	79
<hr/>	
217	

Note particularly the last figures. Nearly 40 per cent. of those answering had absolutely no idea what preparation they were using! The others require little comment. It is quite evident that Colgate's advertising has not been entirely in vain.

4. *Why do you use that particular kind?*

Some reason given by.....	85
"I don't know".....	132
<hr/>	
217	

These figures are illuminating. No less than 60 per cent. of those using tooth preparations had no reason to venture for using the particular preparation which they did. They had not even the glimmer of an idea whether or why it might be better or worse than some others. To them a tooth preparation was a tooth preparation and would clean the teeth. To use something was the main object.

No less illuminating are the reasons given by those who did venture a reply to the question:

Like the taste of it.....	55
Advised by a dentist.....	19
Have always used it.....	5
Widely advertised.....	3
Know the maker.....	2
High price.....	1
<hr/>	

To these I might add two which were received the year before. They were, "Prevents infantile paralysis" and "Ma makes me." It is interesting to note that of the 19 cases where some preparation was advised by a dentist, all but two were preparations which bore the dentist's own name. Of the two exceptions to this rule, one was a preparation containing two ingredients which should never be found in any dentifrice, and the other was a preparation which the dentist said "must be all right or they wouldn't advertise it so much." Not one of the reasons, even that of the dentist himself, makes the slightest allusion to any property of the preparation which would indicate suitability to purpose, high quality or anything else which should govern a thinking person when choosing a dentifrice.

I believe that the foregoing is sufficient to show that there is at present in our State a condition of things which should make us the least bit ashamed of ourselves. Is it not evident that these young people, arrived at an age when they should be taking intelligent care of their teeth, had very little knowledge of the dentifrices they were using, and that the correctness of even that little knowledge was open to very serious question? Is it not clear that, while tooth preparations are used by nearly everyone, the general public has little or no knowledge of their composition, effects or real value?

If further proof is needed, it may be readily found in the number of different preparations on the market to-day. This number is almost beyond computation. There are literally hundreds, perhaps thousands, and new ones are springing up all the time. In one small drug store I counted 88 varieties, and I have no doubt there were a few others under the counter. These all sell for a good price, yet the cost of the basic material is very small. In more than one instance the container has been shown to cost more than the contents. The large demand, of which we have spoken, together with the immense profit, has produced a sharp competition among manufacturers to supply the drug store trade, and this has resulted in many worthless and some harmful preparations being thrown upon the market. The pity of it is that the worthless and even the harmful seem to enjoy as wide or wider popularity than do the desirable preparations.

The method of advertising these numerous preparations reflects the ignorance of the day. Seldom, if ever, is quality and suitability to purpose made prominent. A delightful flavor, a new container or something similar is the advantage urged. Also, those secondary advertising dodges, such as appearance of package, etc., are made much of. One powder is put up in an elaborate pressed glass bottle. It would be interesting to compare the cost of that bottle with the cost of the powder it holds. Does the elaborate bottle make the powder any better? Does it enable the manufacturer to serve the customer to better advantage? Hardly! The hope is that, without regard to what the powder may be, the purchaser will be impressed with the desirable appearance of the bottle, and will buy the *bottle*, taking the powder because it is impossible to get the bottle in any other way. That same bottle is about a quarter of an inch thick, which insures that the purchaser shall not get too much for his money. Another bottle has an exaggerated wasp-waist effect, another is diamond shaped, and another has a highly colored picture of an alleged beautiful young lady—all that the contents may be forgotten in the attractiveness of the container.

The dental profession must shoulder its full share of responsibility for the ignorance, misinformation and misrepresentation which these things imply. It is all very well to say, as one dentist did to me, that it is not your business, that the schools can and should incorporate it as a part of their work, but this shifting of responsibility does not meet the question. I agree that the schools should have their part in this work of education, but let there be some *dental* as well as public schools. Let our dentists be our instructors, and then we shall have a corps of teachers who can speak with authority and to whom the public will listen, as they will not to the layman.

The information most needed by the public at large is neither elaborate nor technical. Rather it is the simple, practical facts which appeal to their common sense, and give them a method of determining for themselves whether or not the use of any particular preparation is wise. The following is a brief outline of some such facts. To you they may be old stories, but to the majority of people in your city they would come as new and interesting information:

Tooth preparations are of three classes—powders, pastes and liquids. The first two are known as dentifrices, the last as collutoria. Powders were perhaps the earliest sort of tooth preparations. They were made then, as now, principally of chalk, magnesium carbonate, soap, flavor, sometimes artificial color, and occasionally, also, some antiseptic substance.

The chalk is the scouring and polishing agent, and should be the finest precipitated chalk, in order that it may not scratch the enamel. Sometimes prepared chalk is substituted. Prepared chalk is NOT precipitated chalk. It contains many small, gritty particles which are hard and sharp enough to cut into the teeth. It should never, therefore, be used in a dentifrice. Other substances sometimes used as abrasives are pumice stone, charcoal, orris root, etc. None of these has any place in a tooth powder. The pumice stone cannot be prevented from scratching the teeth, and charcoal, orris root and other vegetable substances will, if the slightest particle remains between the teeth, give rise to the same sort of fermentation and consequent decay that would be produced by particles of food under similar circumstances.

The light magnesium carbonate is usually employed to give bulk to the powder. It has no particular scouring or polishing ability, and its only advantage (?) is that we are deceived into believing that we are getting a large amount for our money.

The soap serves two purposes. It has a certain cleansing quality, and serves also to make the powder slightly alkaline. It is needless to say that only the best quality of soap should be used, but some manufacturers have been strongly suspected of using up their "odds and ends" in this profitable way. Even so good a thing as soap may become less valuable, however, if too much of it is used. There are some otherwise excellent dentifrices on the market in which the quantity of soap is so large that they have a tendency to cause the brush to simply slip over the teeth, instead of scouring them, and thus much of the good effect of the precipitated chalk is lost. Too much soap may almost be considered as an adulteration.

The flavor of a tooth preparation is of greater importance than might appear at first thought. A dentifrice with a dis-

agreeable taste is about as useless as one which contains something actually harmful. Few people can be induced to properly clean the teeth when the cleansing process involves the use of an ill-tasting mixture.

Artificial coloring is used solely to attract the eye. It adds nothing to the value of the powder and should be omitted, though it does no particular harm.

The value of antiseptics in tooth powders is very problematical. They do not remain in the mouth long enough to enter into complete solution, and certainly not long enough to render it sterile unless the quantity of antiseptic is abnormally large. One of the chief benefits of an antiseptic—to the manufacturer—is that it furnishes an excellent opportunity for some attractive advertising, and this feature is not neglected. It is even overdone, and some statements are made which would not look well in the light of a little accurate knowledge. For example, one manufacturer prints on his box this statement: “————— tooth powder stands alone as an ideal tooth powder, containing ALL the valuable germ destroying antiseptics.” Just analyze this statement for yourselves and make your own comments.

There should be a very sharp distinction drawn between *flavor* and antiseptic quality. Too often these are confused, and the flavor is regarded as playing a large part in the cleansing process.

Briefly, then, the good tooth powder will contain:

(1) Precipitated chalk, because this will scour the teeth without scratching them.

(2) A moderate quantity of good soap, to aid in the cleansing process and to render the powder slightly alkaline.

(3) A flavoring material of pleasant taste, to promote its thorough and frequent use.

(4) No such substances as prepared chalk, pumice stone, orris root, charcoal, mineral acids (except boric acid), mercury or potassium salts, salicylic acid or salol, or others which might have a harmful effect on the tooth structure.

After the powders came the liquid preparations. Evidently these cannot scratch the teeth, and they have been frequently

advertised as possessing this desirable quality. This is indeed true, but a danger as bad as scratching lurks in some of them. Several on the market are slightly acid in reaction, and the harmfulness of this need not be discussed. Many more are mere frauds, containing nothing except water in which a little soap has been dissolved, and which has been highly colored and flavored. Ivory soap and water would be a thousand times more desirable as a tooth cleanser. One manufacturer charges fifty cents a bottle for a mixture composed mainly of tannin and water, and advertises it as possessing wonderful qualities. It should be distinctly understood that to purchase the ordinary tooth liquid is a waste of good money that cannot be too severely frowned upon. I do not, mind you, refer here to gargles, but to those tooth liquids which are supposed to act merely as tooth cleansers.

The pastes are very similar to the powders. Indeed, they are practically the same thing, made into a paste by means of glycerine and gelatin. They possess the same good qualities, and if bad are open to the same objections. In fact, a scratching paste is worse than a too abrasive powder, because it clings more closely to the brush and comes into rather more intimate contact with the teeth.

Elaborate chemical analyses are not necessary to determine the suitability of the ordinary dentifrice to its purpose. Simple qualitative tests, combined, if desired, with microscopical examination, furnish all the information needed. Such tests may be similar to the following:

(1) *Scratching.* Place some of the sample upon a microscopic slide, moisten with water and cover with another slide. Rub the two slides together freely with this thin paste between them. Wash and dry the slides. Hold to the light and examine for scratches.

The slides are made of extremely hard glass, and any tooth powder or paste which will scratch glass under the above conditions should not be used for the purpose of an ordinary dentifrice. If a powder or paste feels gritty between the teeth, it should certainly be subjected to this test, carefully made, at once.

(2) *Alkalinity.* Shake a small amount of the powder or

paste with water, and add a drop or two of phenolphthalein solution (made by dissolving phenolphthalein in alcohol). A basic reaction is shown by the appearance of a bright pink color, and the preparation which will not produce this reaction should be rejected.

(3) *Soap*. Shake a small portion of the sample with warm water. The amount of foam produced is a very rough indication of the quantity of soap present.

(4) *Carbonate*. A few drops of hydrochloric acid added to the preparation will, by the effervescence, indicate the presence of a carbonate. If it is desired to carry this test further, the usual chemical tests for calcium and magnesium may be made.

(5) *Microscopic examination*. For the dentist the microscope furnishes the quickest and at the same time a very satisfactory means for the detection of harmful substances, especially in powders. Comparison with ingredients of known purity will quickly show the presence of anything deleterious.

In discussing this question I have spoken very frankly, and perhaps rather strongly at times, because I believe that it is the duty and the privilege of the Massachusetts Dental Society to take a much more active part than it has in the past in disseminating accurate information regarding this and other important branches of oral hygiene. There are several very definite lines of activity which, if undertaken generally and carried out conscientiously, would, I believe, result in very great good to the people of Massachusetts. With your permission, I will, in closing, suggest one or two such avenues of effort.

(1) *Take your patients into your confidence*. Talk English to them and do not simply befog their minds with technical terms which mean nothing to them. Advise them definitely, and tell them *why*, being very certain that your own explanation will stand the light of day.

(2) *Encourage and work actively for the spread of accurate information in the schools*. This is being done to some extent, but not actively enough. See to it that such instruction is given in high schools as well as in the grades—and to the teachers as well as the pupils. It might not be out of place to hold

meetings in the school for parents, just as the doctors are doing in connection with tuberculosis.

(3) *Frame and secure the passage of a law requiring the manufacturers of all dental preparations to print upon the label their complete formula (including proportions).* In no other way can the public be better safeguarded against inferior dentifrices. Make *all* do what some of the more reliable are doing at the present time—state honestly the composition of their preparations. Make it possible for the dentist to recommend dentifrices which may be bought in open market and still not violate that excellent statement of your Committee on Preparations, that “no profession should be called *learned* that uses or prescribes secret remedial and prophylactic preparations.” This Society has some influence at the State House. That has been very evident during the last few weeks. Use that influence to secure something even more important to the people than the appointment of a satisfactory examiner.

If you can do this one thing alone for our protection, I believe you will have done a work worthy of comparison with the fight of physicians against the white plague, and I believe that you will gain for the Massachusetts Dental Society a place of respect among the people of this State that no other society enjoys.

MASSACHUSETTS DENTAL HYGIENE COUNCIL**SUGGESTIVE OUTLINE FOR LECTURE ON ORAL HYGIENE**

[The following outline for a lecture on Oral Hygiene was drawn up by the Dental Hygiene Council of Massachusetts for the use of its Board of Lecturers.

Modified to conform to the requirements of individual types of audiences, it will be found useful as a suggestive brief in the preparation of talks on Mouth Hygiene.]

I**INTRODUCTION**

Stimulate interest in the subject by emphasizing the importance of the mouth as an essential element in the digestive system in the maintenance of health.

2**ANATOMY AND PHYSIOLOGY OF THE MOUTH**

Describe without too much detail the anatomy and physiology of the mouth, including

- a. The general anatomy and position of the teeth, temporary and permanent.
- b. Their eruption.
- c. The anatomy of a single tooth.
- d. The use of the teeth in cutting and grinding the foods which form the diet of man, in comparison with the teeth and diet of the carnivora and herbivora.
- e. Movements of the jaw in mastication.
- f. General description of accessory muscles of mastication and deglutition.
- g. The salivary glands and ducts.
- h. The organs of taste.
- i. Mastication and insalivation.

Show the importance of proper food selection and thorough mastication, calling attention to the beneficial effects on nutrition and on the teeth themselves of such food as the thick-crust, fully-baked, whole-grained bread or Swedish hard bread, properly masticated, in comparison with the ill effects of soft, mushy foods, and sugar, in the shape of sweet cakes, chocolate, candy, etc.

3

PATHOLOGY OF THE MOUTH

General description of the cause and progress of dental caries.

Show the effect of carious teeth :

1. In lessening or destroying the functional efficiency of the mouth.
2. In providing an incubator for micro-organisms, increasing the danger of infection by various diseases through both the digestive and respiratory systems.

Brief description of pyorrhea.

4

Call attention to reflected pains of diseased teeth occurring in the eye, ear, face, head, neck and other parts.

Describe causes and effects of irregularities and mal-occlusion.

Call special attention to the importance of the loss of the first permanent (sixth year) molar and show why it is often mistaken for a temporary tooth.

Show the results likely to follow from neglected teeth :

- a. The effect in childhood of badly diseased teeth on growth and development and on the ability of the child to cope with school duties.
- b. The lifelong evils often observed as the result of dental disease.

5

Give brief description of methods of repair of dental defects, including dental caries, abscessed conditions and irregularities.

Emphasize the fact that this is not the great aim of modern dentistry. The study of great importance to dentists and the laity to-day is

6

PROPHYLAXIS

The all-important question is, "How may we prevent diseases of the teeth and consequent suffering and loss of functional efficiency of the mouth?"

Emphasize the maxim "A clean tooth never decays," and show why, referring to cause of caries, already described.

How may the teeth be kept clean?

As they are made unclean chiefly by the food débris remaining after meals between them and in the deep sulci of their grinding surfaces, the point of most importance is, naturally, the removal of all bits of food which remain in such places after each meal:

1. By the use of floss silk.
2. By proper brushing with a tooth brush.
3. By rinsing the mouth with water, or a mouth wash, preferably warm.

Demonstrate proper use of floss silk.

Show correct shape and proper use of tooth brush, comparing modern serrated brush to a series of toothpicks, this comparison enforcing on the mind the feasibility of the up and down motion.

Show why the brush should be used.

- a. On arising in the morning.
- b. After meals.
- c. Before retiring.

Advise use of dentifrice (explaining why) once a day.

Suggested Formula for Tooth Powder

(Adopted and recommended by the Mass. Dental Hygiene Council)

Precipitated chalk.....	6 drams
Perborate of sodium.....	1 dram
Powdered soap.....	20 grains
Oil of wintergreen.....	15 minims

Recommend a mouth wash and give reasons for its use.

7

With the utmost care by the patient, under our present habits of diet, all troubles cannot be prevented by personal attention alone, and it is necessary that patients should have a thorough examination and such treatment as is needed by a dentist at stated periods in accordance with the needs as he sees them.

These visits are necessary:

- 1st. For the filling of such cavities as may start in spite of all precautions.

- 2d. For the removal of tartar, which collects in most mouths, particularly near the orifices of ducts from the salivary glands and which cannot be kept away by the use of the tooth brush alone.
- 3d. For the polishing of the surfaces of the teeth where a slight abrasion once started forms a starting point for caries.

8

CONCLUSION

A brief summing up of important points, again emphasizing the importance of proper care and use of the teeth, with reference to their influence on the general health and the power to resist disease.

REPORTS OF SOCIETY MEETINGS**FIRST DISTRICT DENTAL SOCIETY OF THE STATE
OF NEW YORK, FEBRUARY 3, 1913.**

A regular meeting of the First District Dental Society of the State of New York was held at the Academy of Medicine, 17 West Forty-third Street, New York City, on Monday evening, February 3, 1913.

The president, Dr. H. L. Wheeler, occupied the chair, and called the meeting to order.

The programme of the evening consisted of a discussion of the present status of oral hygiene in the Public Health Departments and public clinics.

Dr. John W. Brannan, president of the Board of Directors of Bellevue Hospital, gave a résumé of what has been accomplished for the children in the dental clinics of Bellevue, Gouverneur, Harlem, and Fordham hospitals during the past five years. He expressed himself as pleased with the closer relationship that is being established between physicians and dentists as they are brought together by this work in the hospitals, and the recognition by physicians and surgeons of the importance of oral hygiene in the matter of health.

Dr. W. A. Howe, Deputy Health Commissioner of New York State, who was largely interested in having dentists appointed as consultants and lecturers in the State Department of Health, spoke of the rapid progress that has been made by oral hygiene in his department within a year and a half. Dr. Howe continued as follows:

Within this limited period, there is no branch of our work which is to-day being received with such favor as that of oral hygiene. We are receiving more requests for this particular feature of our educational work than for any other.

During this short time, approximately, 200,000 children have been taught by illustrated lectures the value of a clean mouth. . . .

We believe, in this movement of oral hygiene, that the place

to begin is with the child. We believe that the solution of most of our public health questions to-day depends upon our ability to reach the children at school, and when the time comes that we, as teachers, can rear one generation of children thoroughly taught or impressed along the science of preventive medicine as it pertains to both the teeth and communicable diseases, then will our efforts in the future be easier. . . .

One of our lecturers, Dr. White, has also gone into some of our normal schools, . . . to show them the necessity of this particular line of work, so that we hope and expect within the next few years to be able to teach the graduates of our normal schools and colleges this special line of work, in order that they may carry it with them in their future work. As a direct result of this campaign we have the satisfaction of knowing that free dental clinics have been established in five or six of the cities of this State.

We find, gentlemen, that this movement is popular; we believe that it is important. We do not believe that poor teeth are responsible for all of the ills to which mankind is heir, but we do believe that with good teeth we are much more apt to enjoy good health, and we believe there is no better place to begin to conserve the health of our children and of the human family than at the very entrance of our bodies. We believe that the idea of cleanliness, which is so indispensable to the success not only of oral hygiene, but of surgery and public health in general, is in no place more applicable, or more essential than in oral hygiene, and that if we can preach this gospel of cleanliness it will not only advance the interest of oral hygiene, but of general hygiene, and in doing so will prevent many of the communicable diseases which we are devoting our time to suppress. I think that briefly covers the activities of our department.

We have issued a little leaflet of seven pages that we call "Mouth Hygiene and the Care of the Teeth," which we use extensively throughout the State. A few days ago we received a requisition from Elmira for 3,600 of these leaflets. The demand has been so great that the largest edition is exhausted, and another is being put through, so that when we visit a town or city to interest the dentists, we interest the educators of that com-

munity, and leave with them literature they can use in families, where they may think best.

I want to intensify one thought which Dr. Brannan raised, and that is the question of typhoid vaccination. You will excuse me if I digress a moment. I am possessed of a most striking illustration of that very thought which he brought forth, of the indifference of some to avail themselves of preventive measures. I happen to know of a single institution in this State where there are some 1,200 inmates. In that particular institution they have been suffering for years with an annual outbreak of typhoid. We have really been unable to determine the cause, and each year, beginning about the first of September, we would have a variable number of typhoid cases. During the past year every inmate of that institution took the typhoid vaccination, with two exceptions—attachés—and we have been free from typhoid for the first time in many years, with the exception of two cases, and those two cases were in the two attachés who refused to take the vaccination.

Dr. John J. Cronin, of the Department of Health of New York City, told of what is being done for the teeth and mouths of the children in the public schools of New York City. He spoke of the inception and growth of the work, and expressed encouragement for the future of oral hygiene in the city schools.

Further reports of the progress of the oral hygiene movement were contributed by Dr. W. A. White, of Phelps, N. Y.; Dr. W. W. Smith, of Rochester, N. Y., and Drs. Ellster, Nodine, Chayes, and Daly, of New York City.

FREDERICK C. KEMPLE,
Editor First District Dental Society of New York.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK, MARCH 3, 1913

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, March 3, 1913, at the Academy of Medicine, 17 West Forty-third Street, New York City.

The president, Dr. Herbert L. Wheeler, occupied the chair, and called the meeting to order.

The paper of the evening was read by C. J. Grieves, D.D.S., of Baltimore, Md.¹

Discussion of Dr. Grieves's Paper.

Dr. George Evans—I think this society is indebted to Dr. Grieves for the presentation of a scientific paper such as he has just read. It shows investigation and study in which all are interested at the present time.

As I understand this paper, it is a discussion of the conditions that arise from pyorrhea, for the purpose of arranging a classification so that in a series of symposia they can be intelligently discussed. Also that the general practitioner desires and is entitled to more light on these subjects so as to guide him in his daily practice, enable him to diagnose and, with more confidence, proceed with his operations. With this object in view Dr Grieves describes decay of the teeth and prophylaxis. He calls attention to the fact that in some instances clean teeth decay and also that many unclean teeth do not, as stated by Kirk. He shows that fermenting carbohydrate food debris does not constitute the actual cause of decay, as the saliva itself contains fermentable substances active in generation of the lactic acid bacteria; thus proving that the present oral hygiene movement, although beneficial to the general health of a large proportion of children, nevertheless only lessens the percentage of decay of these teeth. I think that this absence of decay in cases of unclean teeth can be explained by the absence of fermentative processes in the intestinal tract either by the fact that carbohydrates have not been consumed or the ability of the digestive organism to overcome and harmlessly and

¹ See p. 96.

effectually eliminate them and their waste products. A proper occlusion of the teeth and artificial restoration of lost teeth aids, as mentioned by Dr. Grieves, in mastication. The dietetic conditions discussed by Dr. Grieves, such as fermentative processes in the stomach and intestinal tract of carbohydrates, resulting in putrefaction of proteids and causing auto-intoxication of enterotoxins and ptomaines, is probably the most active cause of derangement of the secretions of the oral cavity.

But behind all that has been so carefully studied and scientifically investigated and presented to date respecting the etiology of decay of the teeth and of pyorrhea alveolaris—as it is termed—they stand as conditions far from being well understood. In a consideration of these conditions history should be kept in mind. By this I mean that the teeth and the oral cavity of man were not always inclined to the pathological conditions which are now sometimes present.

To consider this from a rational standpoint, set aside the subject of the spiritual in man and discuss him from that of the animal. Man, according to Huxley and Darwin, is a descendant of the animal through evolution. Those opinions, though, are theoretical. But the investigations of recent years by anthropologists, from the skulls and bones they have discovered, place beyond question the fact that prehistoric man existed in Europe in a condition close to that of the animal. As present man is a descendant from this prehistoric being, let us ask when and where in his history did pathological conditions of the oral cavity commence and especially become prevalent. Investigation shows that originally man was free from such, as much so as animals in a primitive state. We find this also in most savage tribes at the present time. Next, let us consider what induced the conditions as we now find them. It has been caused by civilization, enlightenment, and environment, and especially the food we eat and the manner in which it is prepared to make it palatable and easy to consume. Going back as far as we can to such times when civilization changed man from his prehistoric condition and the survival of only the fittest, to a certain amount of luxury in the way of environment and food supply, we begin to find a tendency to dental lesions. In the days of the Phoenicians and Romans and

to some extent among the ancient Egyptians we find evidence of these conditions. At the present time, especially among the American people, carbohydrates are consumed to an excessive degree and proteids in the form of meats too largely indulged in. Besides, in the use of bolted flour alone and in combination with other food substances, mastication is rendered too easy and the stomach oversupplied.

This is where our troubles commence respecting dental lesions, arthritis, and indeed many diseases, the increase of which perplex and baffle science at the present time. Excessive nutrition tends to mal-conditions. Lack of exercise, overtaking the brain especially in years of adolescence and excessive nerve strain affects digestion and deranges the system. The question is, Can we materially change these conditions at present in life? It will be impossible. We can only remedy them by a better understanding of their etiology, and agents and methods to combat them.

The arrangement of mouth classification to the food habit and nutritional balance as presented by Dr. Grieves shows careful study of conditions, and we ought to assist in any necessary revision.

In regard to the use of dental splints in cases of pyorrhea, I agree with Dr. Grieves in requiring rigidity and strength especially in the metallic connections between the different teeth, much more so than in cases of bridge work, for in occlusion the teeth have not the foundation in the alveolar process afforded by teeth in a normal condition. I never devitalize the pulp of a tooth affected with pyorrhea unless the conditions demand it. These may be: (a) Extreme hyper-sensitiveness. (b) Loss of the alveolar walls to such an extent that subsequent absorption is likely to leave the roots nearly or entirely exposed after splint is inserted. (c) Teeth that are in form or in position so placed as to render their connection or capping not reliable or practical.

I consider a tooth with a vital pulp, even though it is partly calcified, responds to treatment for pyorrhea and maintains a better condition of its remaining connective tissue, than when the pulp has been removed. I agree with Dr. Grieves that the innumerable small anchorage devices, etc., he mentions, are not to be relied on. Inlays and such have proved to me to be failures,

except occasionally in the case of a single tooth specially favored by some condition respecting occlusion. I agree with Dr. Grieves that hygienic conditions must be observed, and that the V-shape space at the gum margin must be maintained so that prophylaxis can be practised.

Dr. Hutchinson—Dr. Grieves's paper is so comprehensive and deals so exhaustively with the subject of classification and etiology of mouth infections, that it would be impossible without going to some length in making a formal discussion, to enter into it at all. It is quite tempting, inasmuch as the essayist's views and mine do not entirely agree as to etiology, but I am going to resist the temptation to discuss that side of the question, and confine myself more to the matter contained in the latter part of his paper.

He mentioned prophylaxis, toward the beginning, and I want to speak of that as well.

The essayist's opinion of prophylaxis seems to be that the benefit is derived very largely from the frictional action in this treatment. I must say I do not agree with that view. It is stimulating to a certain extent, but he says he cannot understand how that frictional stimulation will benefit the teeth for the remaining twenty-nine days. I do not either.

Dr. Grieves—I said I did not see how that could affect the growth of a film, and why that film would not grow on there the next day. I know it does, because I have stained it the next day, and the next day. I appreciate the effect of stimulation, and I appreciate the value of massage.

Dr. Hutchinson—My idea of the value of prophylaxis is that the tissues are made more or less resistant to destruction from foreign matter in a state of decomposition. The idiosyncrasy enters there. I believe in every case systemic conditions must be taken into consideration. Predisposing factors and acquired factors must always be considered anywhere in the anatomy. How much irritation—and of how long duration—will the tissues in an individual bear before breaking down?

True prophylaxis is that conducted by the patient who has been properly trained, for what the patient does during the entire month is far more effective to the tissues than what the

operator does once in two or three months. Some individuals are able to keep their mouths very clean. There is not as much necessity there for as frequent prophylaxis as in others. In some the resistance to irritation is higher than in others, and there prophylactic treatment is necessary only occasionally in comparison with those who are non-resistant.

It is a matter of invasion. I said I would not speak of etiology, but I will to this extent. I look upon mouth infection and tissue destruction as being a battle between an invading force and a defensive force. There is a balance either maintained or lost on one side or the other. Without an invading force, there is no necessity for a defensive force; but there is in almost all mouths this invasion. When the defense overbalances the invasion, there is no destruction or infection of the tissues. When the invasion overbalances the defense, our prophylactic treatment comes to the rescue and restores the balance to the proper side. The frequency of treatment should be based upon observation in each individual case. When we find inflammation beginning to be present through this infectious mass, it is time for prophylactic treatment. This may vary at different times in the history of an individual, too. It should be done as perfectly and with as little irritation as possible to the soft tissues.

I am heartily in accord with the essayist's opinion in regard to the effect mal-occlusion has. The general mal-occlusion we find in children's mouths, prevents normal function from being performed, and that inevitably results in malnutrition of the parts. It also induces the accumulation of food debris.

As the essayist has said in regard to the matter of the occlusal planes, lateral stress is brought to bear, traumatism is the result, and an infection of the tissue is made possible through the presence of infected foreign matter in contact with the tissues when the resistance has been broken down.

As to retention, I believe, in the great majority of cases where artificial retention of the posterior teeth is necessary, in order to establish and maintain function, that it is far more desirable that those teeth should be removed. Multi-rooted teeth invariably afford lodging places for food debris when there is extensive loss of the supporting tissues, and it is practically im-

possible for the patient to maintain a sanitary condition. A sanitary artificial substitute is preferable to an unsanitary natural organ, and I would rather see that organ removed and a sanitary substitute placed there every time, because no patient can keep such a place clean.

Sanitation should be our ultimate object—sanitation by the patient during the interim between prophylactic treatments. In the anterior teeth, it is a different matter. We have single-rooted teeth.

The retention of teeth in a pathological condition is always contra-indicated. We must restore a physiological condition, before thinking of retention. If the case promises good results, then the teeth may be retained, always bearing in mind the ultimate maintenance of sanitation.

I believe it is far better to keep living pulps in the teeth. Experience has shown me that it is desirable that the pulps should be maintained unless they are in such a pathological condition that their death is inevitable. I have seen many cases in which pulps have been removed, and many in which the pulps have been allowed to remain alive; and with hardly an exception, the tissue surrounding the teeth with live pulps has been better than where the pulps were removed.

It is quite possible to construct splints in such a way that they will be sanitary. As a general rule, the normal support of the teeth is far in excess of the requirements. It is similar to the rule employed by bridge engineers. They never build a bridge strong enough to only bear the weight put on it; they always leave a margin of safety. I think in the average mouth the normal support is far in excess of the necessities, especially as we grow older. Even where two-thirds of the supporting tissue has been lost, providing the remaining one-third is in a tonic condition, there is sufficient support without recourse to splints. If we cannot restore the tissues to a tonic condition, then, of course, the teeth should be removed or splinted.

Where a bridge has been placed in a mouth affected with pyorrhea, it will be found necessary at certain periods to grind the teeth at certain points. When tooth comes in contact with tooth, the teeth will be worn away, but that will not occur with

artificial substitutes. It is wise never to make deep cusps in bridges, especially in pyorrhea mouths. The occlusal planes should be more nearly horizontal to prevent that lateral thrust which invariably occurs.

I have seen cases where the occlusal surface of the dummy or the abutting crown is made by biting into soft material and reproduced without carving. That is fatal to the teeth used as abutments.

Another point to be taken into consideration is when the teeth have been moved out of place through malposition of the occlusal planes, and they are ground in such a way as to prevent individual motion in occlusion or mastication; they may move back again after a few days. The tendency always is for the teeth to resume their normal position, and so it is frequently necessary—two or three times in some cases—to retest the occlusion and regrind the facets. Then the grinding is necessary only after an interval which causes the unequal stress to recur.

I want to reiterate, always have in view the establishment and maintenance of sanitation.

Dr. Grieves has not referred to any cases from practice, but I want to tell you of a case that came to my attention in which the surgical treatment was given by Dr. Coriell, of Baltimore, and Dr. Grieves had splinted all of the upper teeth remaining in the mouth—I think from first molar on one side to the second bicuspid on the other side.

Dr. Grieves, I think, practised pulp removal in the case of every one of those teeth. The piece was very rigid, and giving most efficient service. I want to compliment him on that. Dr. Grieves is not theoretical. He has demonstrated to my satisfaction the practicability of the work he has described.

Dr. M. L. Rhein—In one respect I differ with the essayist. He says no two men agree very much on this subject. I have been in almost thorough accord with the essayist on practically all he has said to-night, and on previous occasions. The only point that I feel he, perhaps, has not made clear, is that his work has been such that he has been confining himself to one type of case.

The classification he has presented to us in regard to our

viewpoint of the food habit and nutrition is a very interesting one, and it brings to my attention the point that I have frequently raised—that this subject can never be properly discussed, unless we discuss it with a well recognized idea of its etiologic classification.

The late Professor Miller paid me a great honor when he put into his work on operative dentistry the etiologic classification which I introduced to the profession at the meeting of the American Dental Association in the early 90's, and I have been very much disappointed that in the discussion of pathogenic conditions around the peridental tissues so little attention has been given to a classification in discussing this subject. In that classification I speak of arthritic pyorrhea, and that is practically the condition that the essayist has given most of his attention to.

In this day there can be very little difference of opinion. When I talk to Dr. Hutchinson, he does not agree with Dr. Grieves or myself. He says he does, but he really does not. There is no such thing as a specialty in pyorrhea, because the treatment of those conditions embraces the practice of everything in the field of dentistry. If Dr. Hutchinson were working with the feeling that he was attending to every field of dentistry, he would not reach the conclusions he has reached in regard to the removal of pulps in these conditions, which is so absolutely in contradiction to the conclusions of the essayist and many other men. He also said it was not, in his opinion, practicable to save posterior loose teeth where the roots were very much exposed, on account of the difficulty of keeping the interspaces clean. I admit this is not a simple operation or one that can be performed with ease. The fact is, none of the operations necessary to preserve loosened teeth can be done with ease and be a success. When he said remove these teeth to get the best result, the same applies to every form of dental operation, unless the patient can afford to have the very best kind of operation done. Anything less than this does not and will not produce a good result. In other words, the preservation of such teeth cannot be honestly placed in the category of things that can be given to a man in the ordinary sphere of life. It is a luxury that only the rich can

afford, unless you are willing to do it without recompense. But that such teeth can be preserved when the pulp is removed and all of the spaces that exist between those portions of the root that are exposed, can be closed, is a fact that has been and is frequently demonstrated.

Another point on which I must take issue with Dr. Hutchinson is in regard to the smooth planes on the teeth. I agree with him that mal-occlusion is the most important mechanical consideration we have to deal with; but he advises the insertion of appliances with smooth planes, and such appliances, I believe, simply keep up the mal-occlusion. It is impossible to restore occlusion properly with a smooth plane; and I would say that those teeth in which sulci cannot be cut deep so as to get the proper pestle and mortar effect, and do efficient service under such work, had better be removed under all circumstances.

Dr. Hutchinson—I do not advocate the establishment of plane against plane. I did not go into a detailed description in regard to what I do. I should have mentioned that plane against plane is absolutely contraindicated, and never should be tolerated. There should be a convex surface against plane, or convex against convex.

A Member—You mean convex against concave?

Dr. Hutchinson—No, convex against convex.

Dr. Rhein—We as dentists owe much from an educational standpoint to what the orthodontists have given us in the past few years, and if they have taught us one thing better than any other, it is the importance of the preservation of the deepest kinds of correct restorations of sulci.

Dr. G. F. Eames, of Boston—Not expecting to discuss this paper, I can hardly do more than compliment the author upon being able to do so much work as is outlined in his classification, and doing it so well. I agree with the essayist in theory, but in practice I use a disclosing solution, and remove films and deposits thoroughly. The slightest of these, I believe, may so insidiously run into the abnormal that I have never felt that I was overdoing the operation in cleansing and polishing most thoroughly. In regard to the statement of the essayist that many quit the local treatment of pyorrhea, when they come to believe the cause to be

constitutional, I must say that such a course seems to me foolish, for if this plan is followed many teeth will certainly be lost; while if local treatment is persistently and intelligently carried out, the local expressions of the disease may be made to disappear, and the teeth are saved, even though the cause be constitutional, requiring the treatment to be kept up while the constitutional condition lasts. It is humiliating to believe that there are those who keep up the treatment of pyorrhea indefinitely while pus is still being produced. Surely, any man who watches his case may know if he is gaining or losing ground, and if losing, he does well to sacrifice a tooth in the interest of his patient's health.

I heartily indorse the stand the essayist takes in this regard.

Dr. Herman E. S. Chayes—This has been a very peculiar evening. Dr. Grieves, in his attempt to aid us in standardizing our work, has spent years in compiling what he gave us in his paper, only to have it ignored by those who discussed it.

One delves down into the hazy past to reach into the archives of the human race and another discusses a discussor.

And all this goes to prove how very necessary it is to comprehend conditions before one ventures to speak.

We are all so empirical in our diagnoses and in our work, and, of course, in our results. Here and there such men as Dr. Grieves arise and work laboriously to eliminate guess and substitute science, accuracy and comprehensive knowledge. We must aid these men by falling into step and doing what they suggest; our work will be better for it and more telling in its production of good for our patients.

I obtain as comprehensive a history from my patient as I can, and the clearer this history, the better understanding I have of the case and the better equipped I am to handle it. One can clearly see the advantage of such a procedure over the haphazard manner of treating all cases as if they were the same.

I do not wish to take up too much time, but I should like to touch upon a few of the points unnecessarily brought up by Drs. Rhein and Hutchinson in their talk on occlusion and trituration, and I should like to emphasize the fact that it is not so much a question of depth of cusps as definition of cusp lines. Of course,

depth is to be desired at certain periods, but definition is to be preferred at later periods in life. Then there is the question of extirpation of pulp in splinting teeth, and I want to say that when teeth disturbed and loosened by pyorrheal invasion are to be splinted at all, good surgery and favorable prognosis demands the extirpation of the pulps of these teeth, as does good mechanics. As to the length of time these teeth may be retained in the mouth, that is a question of judgment, and it requires considerable judgment to know when not to retain a tooth. Personally, I believe that no tooth one-half of the support of which has been lost, and which does not readily respond to treatment, is a fit subject for retention.

I have not practised the filling up of the interstices between the exposed roots of molars, for it does not appeal to me as good surgery or decent mechanics.

I want to express my great indebtedness to Dr. Grieves for the privilege of listening to his valuable paper, and I thank you for your kind attention.

Dr. Grieves—I want to say I am slightly disappointed in the trend of this discussion. I felt that this paper would be an appeal to the First District Dental Society of New York that might meet with response. I hoped you would agree with me that we needed some help from all specialists, in mouth classification; that we did not have this matter all worked out. My paper was not entirely on pyorrhea; it was on a general discussion of mouth types, and I felt I could here talk to men who could give us assistance both on the local side and on the constitutional side.

Dr. Kirk has written a great deal about the relations of these systemic conditions to the oral condition, and his articles are well worth careful study.

I have been at some trouble for myself and for you to bring these types before you, and I know the time has arrived when the dentist must know something of the mouth environment, and inasmuch as we cannot all do salivary analysis, as the way is long and weary, we can at least have in our minds, as we look over mouths, these four types. You will feel just a little bit better—it is like “the consciousness of being well dressed”—if you know the general classification of mouths.

The charts before you are a classification of four mouth expressions of diatheses, *not disease*. I purposely have not gone into the general diseases and what mouth conditions result therefrom. I am not writing on oral pathology at all. I have had recently two cases of pyorrhea resulting from chronic appendicitis, another case from a diseased prostate. The cure of the prostate cleared up the pyorrhea with a little local help. It was not my intention to mention all of the diseases which can produce pyorrhea.

I particularly wanted to bring before you the question of prophylaxis, to get some idea whether it should be applied to all mouths. Of course we will take off films in these instances of carious and pyorrhea mouths, but are we going to take them off in every diathesis—in the normal or near normal and in erosion types? I think not, without damage.

As to the pyorrhea specialist, I feel warmly on that subject, because a pyorrhea specialist in Baltimore has helped me out tremendously. I did not know how to do this work, and I never did it correctly. I have a man who is not near me, nor in my office, who specializes in pyorrhea, and it has been the greatest blessing to me and to my patients.

I believe that this is a distinct specialty—I cannot agree with Dr. Rhein in that respect. I want to see it as great a specialty as orthodontia, and it can be done by a combination of men of the type of Dr. Rhein and the pyorrhea specialists.

If I employ a man who is less expert than I am, the results are bad. I would want a man of superior ability right in my office to do this work for me, and nobody short of this standard of excellence, and I could not afford to have such a man. I would have to employ a lower type man, and I would not do that; so I think I am right in sending my patients to a specialist.

I thank you for your courtesy, and I hope this Society will get up the symposia suggested. I know there are medical specialists to-day who are anxious to know what we dentists think about these things. They want to know what goes down the gastro-intestinal tract from the mouth. If we do not get to work and tell them what forms in the mouth, they will get it from somebody else, and we will be classed as mechanics, instead of doctors of dental surgery, and we will get what we deserve.

FREDERICK C. KEMPLE, D.D.S.,
Editor, First District Dental Society.

BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION

At a regular meeting of the Association, held in Boston on April 16, the following resolutions were adopted:

WHEREAS, The report of the delegates of the Boston and Tufts Dental Alumni Association present at the JOURNAL conference, held in New York City, February 15, 1913, shows the uniform courtesy and good fellowship extended to said delegates by the First District Dental Society of the State of New York; be it

RESOLVED, That the thanks and appreciation of this Association be hereby extended to those who had the affair in charge, and that this Association hereby renews its pledge for the advancement of its official organ, THE JOURNAL OF THE ALLIED DENTAL SOCIETIES; that the re-election of its various officers has its full sanction and approval, and that "Professional Journalism Controlled by Dentists" is our motto; further be it

RESOLVED, That a copy of this resolution be spread upon the records of this Society, that a copy be sent to Dr. Wm. B. Dunning, 140 West Fifty-seventh Street, New York City, N. Y., and a copy be inserted in the current number of THE JOURNAL OF THE ALLIED DENTAL SOCIETIES.

THE JOURNAL OF THE ALLIED DENTAL SOCIETIES

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EDITORIAL DEPARTMENT

FOURTH INTERNATIONAL CONGRESS ON SCHOOL HYGIENE

The Fourth International Congress on School Hygiene¹ will be held at Buffalo, August 25-30, and promises to be the most important meeting of its kind ever held. The wonderfully simple fact that the future welfare of a nation may be measured by the health of the children of to-day is a piece of knowledge about as self-evident as the effect of sunlight upon life. It is

¹ See p. 187.

equally a fact, however, that large communities are but even now in the process of waking up to the full significance of what may be done to safeguard and establish the health of school children. Municipal authorities in all civilized lands are following developments in the highly specialized departments of School Hygiene, and this world-need has made possible the great meeting at Buffalo.

We have in hand a long list of notable essayists—men of eminent authority from all parts of Europe—and of American college presidents and professors. This body of experts will present fifteen-minute papers which will be classified under the following sections: (1) "The Hygiene of School Buildings, Grounds, Material Equipment and Up-Keep;" (2) "The Hygiene of School Administration, Curriculum and Schedule;" (3) "Medical, Hygienic and Sanitary Supervision in Schools."

Dr. Charles W. Eliot, President Emeritus of Harvard University, will preside. He will be assisted by a strong organization of officers.

This announcement is made in the official program:

The program committee is particularly anxious that the papers presented at this Congress shall deal largely with results secured through the practical application of scientific facts and procedures of school hygiene, and with the results of scientific investigation and laboratory research. Teachers, investigators, physicians, dentists, sanitarians and public-spirited citizens who have evidence showing that the school hygiene under their observation has been effective and of real service, or who can pre-

sent scientific facts proven by their labors, will be welcome contributors.

Not a small part of the science of school hygiene is comprised in dental and oral hygiene. This congress should receive the hearty co-operation of the National Mouth Hygiene Association and other dental organizations, as well as the individual efforts of practitioners who are willing and able to contribute original material. It calls for some self-sacrifice to attend a busy meeting in the midst of the vacation season; but it is to be hoped that the dental profession will be strongly represented in Buffalo.

THE N. D. A. MEETING AT KANSAS CITY

On July 8 the National Dental Association will meet at Kansas City to "talk of many things"—chiefly the reorganization of its own body—and from various indications it seems likely that the temperature within the auditorium during the four days' session will consistently equal that of the Missouri plains.

The members of the House of Delegates will have in hand the job of creating a working basis upon which the new society, now augmented by the membership of State societies to nearly 7,000, may proceed efficiently about its varied and important functions. This work will be the chief business of the coming meeting and probably of the meeting of 1914.

It is most encouraging to mark this steady growth of a central association, through which the dental pro-

fession in the United States may advance in an organized way in its work of public service. In all likelihood the membership will reach 10,000 by 1915, and it should thereafter steadily advance. As the executive and administrative authority rests with the House of Delegates—a comparatively small body—it will behoove the various State societies, in years to come, to select their representatives with great care. The blighting influence of the personal ambitions of a few men can ruin this work of many years. It is a danger always to be looked for, and eternal vigilance, in fact, will be the price of safety.

A NEW COLLEGE BUILDING

The College of Dental and Oral Surgery of New York has moved into its new building at 302-6 East Thirty-fifth Street, opposite St. Gabriel's Park. The building covers a plot 78 by 100 feet and is of the most approved construction. It is in the center of a populous district where clinical material is abundant, and is easily reached by the Thirty-fourth Street crosstown cars.

The building consists of four stories and a basement. Ample room has been allowed in the three lecture halls, infirmary and laboratories for the very complete equipment designed for the use of over five hundred students, and for the comfort and convenience of patients. Much planning as to ventilation, light and sanitation has resulted in a thoroughly successful building for its purpose.

The Board of Trustees and the Faculty of the college are to be congratulated upon their splendid teaching facilities, which should advance the standard of dental education in New York.

NOTES ON PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S., NEW YORK CITY

Significance of Pus in the Maxillary Sinus.—When pus is found in the antrum, it can be accounted for in one of four ways: (1) It may be due to an extension of infectious material through the ostium from the middle meatus: (2) It may be due to infection reaching the cavity from the root of a diseased tooth: (3) It may be a secondary infection of a non-purulent accumulation of fluid; or (4) the antrum may be acting as a drip cup for the discharge from diseased areas higher up in the nose.—*Detroit Medical Journal, per American Journal of Surgery.*

The Use of Cement with Amalgam.—Experiments with amalgam in cavities so made that the fillings when completed could be removed without destroying any part of the cavity surface, show that it is extremely difficult to fill a cavity with amalgam that will seal the margins and stop decay. Therefore, I consider it good practice to use soft cement in every cavity to be filled with amalgam. I use just enough to cover the cavity surface, removing any surplus with an instrument before starting to use the amalgam; then begin with the amalgam and be extremely careful to pack well. You need not be alarmed at the cement that oozes out at the margins of cavity, as it may be removed and the mixture does no harm. This method in my practice gives good service, and amalgam fillings may be made that no man need be ashamed of.—FRANK J. RYAN, *Chicago, Ill.*

Professional Advice.—Never be afraid to make a fee for professional advice. The dentist who neglects to instruct his patient in the proper, every-day care of the teeth fails in his capacity as dentist to the patient. Most beautiful and accurate restorations have failed in an alarmingly short time because of ignorance on the part of the patient in keeping the mouth in a hygienic condition. It is far easier to prevent dental troubles than to cope with the disasters following neglect.

The Specialist.—The man who can become the greatest

specialist in any one branch of medicine or dentistry is the man who has become great in general practice, but whose ambitions and tendencies lead him to condense his energies to one specialty. With this experience he is conservative in diagnosis, bold and fearless in his field of operation, and usually brings about the most satisfactory results.

Treatment of Teeth Having Pyorrhea.—After the cementum has once been planed to the hard surface, sharp cutting instruments should never be used on it again for fear of opening the lacunae. Should the patient be negligent about keeping appointments for prophylaxis, or be unable to come regularly, and should deposits begin to accumulate again, there is nothing better to use than the style of instruments known as the "Smith Trimmers."—DR. F. H. SKINNER.

Radiographs in Canal Work.—Radiographs are indispensable in expert root-canal treatment and filling. They can be completed in less than ten minutes and save many hours. The operator should not attempt to discover the length of the root by prodding the apical tissue with a broach to see if he can feel the end of the root, or produce sensation outside the foramen.—DR. J. J. MOFFITT, *Dental Cosmos*.

Drying Root-canals.—The important process of drying a root-canal following the extirpation of a pulp can be accomplished—as well as it can be done at all—by applying alcohol of three successive strengths, viz., fifty, seventy, and one hundred per cent., and drying with hot air after each application.—*Archiv fuer Zahnheilkunde*.

Etching Gold Inlays to Obtain Better Cement Adhesion.—The part of the inlay to which the cement is to adhere is dipped in mercury, the surface being evenly coated by using a moist piece of cotton and spreading the mercury around. When this has been accomplished, the inlay is inverted over an alcohol flame and the mercury is slowly driven off, leaving a rough surface for the cement to adhere to.—R. I. LEWIS, *Dental Review*.

Wax Inlays.—It appears to be a very common practice to suck out wax inlays, by the mouth, before investing to cast. Such a procedure is certainly inviting infection, particularly tubercular infection. To obviate any possible danger, a motor

horn, the bulb of an enema syringe, or suchlike, can be conveniently attached to the wax absorber, and will produce the same result without any risk of infection.—H. C. MOXHAM, *Commonwealth Dental Review*.

Sterilization of the Right Angle Hand-piece.—It is very important that the right angle attachment be sterilized after each use, inasmuch as it comes in contact with the mucous membrane of the mouth and the saliva. A method which I have followed during the past five years is to boil thoroughly in water to which has been added powdered castile soap, about one teaspoonful to the quart. After boiling, shake the excess of soapy water from the instrument and place a small drop of oil upon the gearing. The soap prevents rust and furnishes a certain amount of lubrication for the running parts. This method can also be used for the straight hand-piece if it can be detached from the engine. If there are hard rubber parts connected with either hand-piece they can be boiled for a long time without essential damage.—WM. H. POTTER, *Boston, Mass.*

BOOK REVIEWS

BY C. FRANKLIN MACDONALD, D.M.D.

ORAL SURGERY. A Text-Book on General Surgery and Medicine as Applied to Dentistry. By Stewart Leroy McCurdy, M.D. D. Appleton & Co., Publishers, New York and London, 1912. Price, \$3.

A short note preceding the preface of this volume states that the present volume is the first of a series of text-books which has been planned by the Commission on Text-Books of the Institute of Dental Pedagogics.

In this book the author has evidently kept in mind throughout, the fact that he was writing a text-book for dentists. Medical phrases which might be uncommon to the dental man are in most instances fully explained, and the subject matter at all times is discussed concisely, clearly and simply.

The first section consists of the general principles of surgery, taking up the consideration of infectious wounds, hemorrhage, bandaging, shock, asepsis, and diagnosis. The author has only presented an outline of these various subjects, but this is quite sufficient for the end in view. Under germicides, he urges and gives preference to the use of tincture of iodine, and cautions against hydrogen peroxide, so commonly advocated. Diagnostic signs are given most completely, and he says that "one who recognizes a grave condition and insists upon proper treatment is entitled to as much credit as the operator."

The second section takes up oral surgery proper, considering in detail those conditions of particular interest and concern to the dentist.

That rather common condition of alveolar abscess is discussed at some length, and the reader is warned that the opening of the abscess cavity, either spontaneously or by incision, does not necessarily mean that the end of the disease is reached, as many inexperienced practitioners are prone to believe. The process of root amputation is only hinted at, and would seem worthy of more detailed description.

Under general bone diseases the author takes occasion to denounce the excessive and prolonged packing of wounds with gauze, especially bone cavities, stating that nature fills cavities with blood clots for a purpose.

Tumors are considered, first in a general explanatory way, then specifically as they involve the bones and soft tissues of the mouth and face.

Cleft palate and harelip receive a general discussion, with outlines of methods of operation.

The chapter on Diseases of the Maxillary and Other Sinuses is rather brief, but operative treatments suggested are not radical. The doctor evidently believes that permanent closure of antrums under certain conditions is not always possible. The after treatment following antrum operation is not given. Suggestions along post-operative treatment would seem to be of value, not only in connection with the antrum but with those other conditions requiring surgical interference.

Fractures are taken up in considerable detail. The author recommends a more frequent use of bone wiring as a means of treatment in many cases.

Facial neuralgia—stomatitis—syphilis, etc., receive the usual considerations accorded them.

The use of vaccines as method of treatment under certain conditions is not mentioned anywhere throughout the book.

The illustrations could, in many instances, be improved upon; some not being as clear as might be wished.

While written as a text book for students, this oral surgery should prove valuable to the profession at large, especially so for one who, while not practising surgical work, wishes to have a general knowledge of this field of dentistry. This volume is most excellent and the Commission on Text-Books is to be complimented for the first of its series, and it is to be hoped that the others will prove as valuable and adaptable to college work and general interest as is this.

THE PRACTICE OF DENTISTRY. By Leo Greenbaum, M.D., D.D.S., and Max Greenbaum, D.D.S. D. Appleton & Company, Publishers, New York and London, 1912. Price, \$6. The Drs. Greenbaum have shown great ambition in striving

to present to the profession in a book of 800 pages all that there is to the practice of dentistry, exclusive of orthodontics. The authors state in the preface that "the subject matter has been treated to meet the practical requirements of the active practitioner, who in many instances fails to acquaint himself with the most advanced developments in his profession, because he is disinclined to wade through the multitudinous detail to be found in text-books prepared for the education of beginners in dentistry. . . . but which detailed method of treatment is neither necessary nor impressive for the experienced practitioner." This idea relative to actual practitioners may be correct to some extent, but it would seem that those who are not acquainted with the newest methods should be classed as simply advanced students and require the subject matter to be presented in some detail. It is not in the principles that most of the new methods differ, but rather in the details of *carrying out* old principles, and the success and ease of carrying them out depends primarily upon a knowledge of these details. Many of the papers presented before the dental profession are often criticised for this lack of detailed description.

The book is divided into two sections—first, operative dentistry, and, second, prosthodontia.

Under operative dentistry the authors present—most concisely, as a rule—the usual phases of cavity preparation, fillings, treatment, extraction, etc. The theories involved in dental diseases are discussed in some detail and are those most generally accepted.

This section, however, contains some rather peculiar treatments, as, for example, on page 134 the recommendation for injecting into pyorrhea pockets 10 per cent. or 20 per cent. H_2O_2 , and on page 287, "to spray the mouth with a suitable antiseptic solution. . . . for this purpose a 25 per cent. solution of hydrogen dioxide. . . ." When it is considered that 20 to 25 per cent. H_2O_2 is a most powerful escharotic and used for bleaching purposes, this treatment is really dangerous. On page 188, in searching for an agent to "destroy the bacteria of decay" and "not discolor the dentinal tissues," cinnamon is recommended. It would seem as though the authors were not fully acquainted with

oil of cassia and its possible staining properties—and why depart from the old reliable antiseptics?

The authors find no value in the almost universal use of silver nitrate for cauterizing ulcerative spots in the mucous membranes, but would substitute the treatment of touching these areas with 1 per cent. cocain solution for the relief of pain—a most transient relief at the best. Likewise, on page 268, for the relief of pain following extraction, “locally . . . the injection of a 1 per cent. solution of cocain.” Knowing the dangers lurking in the use of cocain, these suggestions can hardly meet with approval.

Pressure anesthesia on pulps which have abscesses or ulcerations, or where in a multi-rooted tooth one canal is gangrenous and the others vital, seems a treatment open to severe and just criticism.

Contrary to the general teaching, rubber dam is urged for the treatment of deciduous teeth; theoretically an excellent recommendation, but practically open to serious difficulties and objections when the age of these little patients is considered. This section is considerably lacking in details of description.

Prosthodontia, however, takes up the various fields of mechanical dentistry in a rather happier way. It goes into more details and with the illustrations better serves as a fair treatise upon plates, crowns and bridges. Anatomical articulation is concise and deals chiefly with the practical aspects. The section upon intermaxillary splints is most meagre and would prove of little value in handling these cases. Mechanical appliances for the correction of cleft palate receives a quite extensive treatment.

On the whole, this book does not seem to rise to the occasion and does not measure up to the standards of present dental literature. Too elaborate for a compendium and not sufficiently lucid to be classed as a text-book of general dentistry, it is doubtful whether this volume will find a great or appreciative field. It certainly is not a book to place in the hands of beginners, and to graduate students or active practitioners it would seem to be one of uncertain value.

DENTAL LAWS CONDENSED. A Brief Guide to the Requirements of Dental Examiners from Applicants for a License to Prac-

tise Dentistry in the United States of America and Island Possessions, Canada, and the Provinces, also the Leading Civilized Countries Throughout the World. By Alphonso Irwin, D.D.S. C. S. Magrath, Printer, Camden, N. J., 1912. Price, \$1.50.

Much vagueness, misunderstanding and ignorance relative to dental laws and requirements for practicing exists among the dental profession. This exists not only among the general practitioners, but also in great degree among those who as dental examiners or connected with various dental schools are often called upon to give advice and suggestions to young men just starting out into practice.

Dr. Irwin has appreciated these facts and the need of some reliable source of information which can be kept at hand, which will give a general knowledge of the various requirements to practice, and will be sufficiently condensed to be easily and quickly understood. To this end he has devoted considerable time and careful compilation resulting in this little volume of 147 pages, which adequately fills the requirements.

All portions of the civilized world are considered, and unless one wishes to study the teeth of Esquimaux in the Arctic or to enter the heart of Africa he can find the requirements for practice in this little book. Also, in some instances, advice as to the prospects for American dentists in foreign countries is given.

The United States and Canadian States are considered separately and in alphabetical order, there being short, concise outlines of the individual requisites.

The information, relative to foreign countries, is likewise arranged in alphabetical order, and is, for the most part, quotations of communications from officials of these various countries who are in a position to accurately give the desired data.

There is a short appendix in which some of the most recent of the laws enacted or amended in the United States are given in full.

This book fills a much felt need in dental circles and should be in the possession of anyone likely to be called upon to give information as to dental requirements, and, needless to say, it should be in the library of every dental school and dental examiner.

Dr. Irwin is to be thanked for this careful work, which is so out of the ordinary and so apt to be little appreciated.

CURRENT NEWS

Items of professional news, of general interest, will be received by the Associate Editor at 51 West Forty-seventh Street, New York City.

The Fourth International Congress on School Hygiene is to be held in Buffalo, N. Y., on August 25-30. Dr. Chas. W. Eliot, President Emeritus of Harvard University, will preside. Efforts are being made to enlist the aid of all who are interested in any way in the betterment of hygienic conditions in the schools and the increased health of the children. There is now being arranged a comprehensive program of papers and discussions covering the entire field of school hygiene. There will be scientific exhibits, representing the best that is being done at the present time, as well as commercial exhibits of practical and educational value to school people. Nor will the entertainment of the delegates in any way be a minor feature. Plans are being made for a series of social events, including receptions and a grand ball, a pageant in the park and excursion trips to the great industrial plants of Buffalo, as well as the wonders of Niagara Falls and the Rapids. Buffalo itself has just taken up a collection of \$40,000 for the purpose of covering the expenses of the congress.

Delegates will attend from all the leading nations, from every college and university of note in this country, and from various other educational, scientific, medical and hygienic institutions and organizations. The congress is open to all persons interested in school hygiene. Membership may be secured on the payment of a five-dollar fee. Applications should be sent to Dr. Thomas A. Storey, College of the City of New York, New York City.

LAYING OF THE CORNER STONE OF EVANS MUSEUM AND DENTAL INSTITUTE AND UNIVERSITY OF PENNSYLVANIA DENTAL SCHOOL.

The corner stone of what is to be the Thomas W. Evans Museum and Dental Institute and the University of Pennsylvania Dental School was laid on Saturday, May 3, with impos-

ing ceremonies, participated in by many prominent men, including Gov. John K. Tener, Provost John Weaver, ex-Provost Charles C. Harrison, Dean Edward C. Kirk and others.

This new building, now being constructed at the corner of Fortieth and Spruce Streets, Philadelphia, was made possible by the will of Dr. Thomas W. Evans, whose boyhood home stood on this very spot. Dr. Evans was one of the pioneers of our profession, being one of the first to introduce contour gold fillings, and for many years he conducted a large and lucrative practice in Paris. During his life he gained a flattering reputation not only as a dentist, but also as a diplomat and a friend of royalty, and he took a large part in the development of dentistry to the position that it to-day occupies.

The will of Dr. Evans provides that there shall be erected "suitable buildings, fire and burglar proof, of artistic and refined beauty, to be called the Thomas W. Evans Museum and Dental Institute," the latter "to be conducted in a way similar in regime as such institutions of learning are conducted and not inferior to any already established." The will also provides that "all objects of art, pictures, paintings, statuary, jewelry, and all objects presented to Dr. Evans by royalty, all books, manuscripts, all original letters and copies of royal letters and autographs of other personalities or distinguished or celebrated people, and all other objects not especially disposed of," be placed in the museum.

When the trustees of Dr. Evans' estate invited assistance in determining the best method for carrying out the terms of their trust, the Administrative Board of the Dental School of the University of Pennsylvania submitted a plan, founded upon a co-operative affiliation, by which the resources of both institutions could be used in following out the purposes of the will. This idea was approved by the trustees of both institutions and was formally adopted on June 15, 1912.

The Dental School of the University of Pennsylvania will therefore be housed in this new structure, and the advantages to be derived from the union of these two interests, in that they will have the same identical purpose, will be exceedingly great. Not only will the two institutions benefit by this affiliation, but

the dental profession, dentistry itself and humanity are all bound to receive an educational and practical uplift.

The resources of the Evans Museum and Dental Institute are sure to have a wide effect, and the opportunities and facilities offered will do much toward carrying out Dr. Evans' wish as expressed in his will, "to place our profession on more commanding ground and thus better serve the generation in which we live."

* * * *

Dr. Charles F. Painter, Professor of Orthopedic Surgery, has been chosen to fill the position of Dean of the Tufts Medical and Dental Schools, rendered vacant by the resignation of Dr. Harold Williams. Following is a quotation from the *New York Times* of May 10:

"Dr. Charles Fairbanks Painter was born at Grand Haven, Mich., May 19, 1869, and is a graduate of Johns Hopkins University, 1891, and Harvard Medical School, 1895. Immediately after graduation from the latter institution he became house surgeon at the Massachusetts General Hospital. He practised three years and then became associated with Dr. Joel E. Goldthwait in the pursuit of his chosen specialty of orthopedic surgery. In 1896 he received the appointment as surgeon at the House of the Good Samaritan, and two years later he was acting as assistant orthopedic surgeon at the Carney Hospital, becoming orthopedic surgeon-in-chief upon the retirement of Dr. Goldthwait in 1902.

Dr. Painter has been appointed orthopedic surgeon to the new Robert E. Brigham Hospital for Chronic Diseases, and has been professor in his special branch of surgery at the Tufts Medical School for the past seven years. He is a member of the consulting staff of the Brockton Hospital; chairman of the Transportation Committee of the Industrial School for Crippled Children; a member of the American Orthopedic Association, the American Medical Association, and the Massachusetts Medical Society. He is editor-in-chief of the *American Association of Orthopedic Surgery*, and, in this capacity, has charge of all the foreign and domestic exchanges."

CORRESPONDENCE

UNIVERSITY OF OTAGO,

NEW ZEALAND.

DENTAL SCHOOL.

PROFESSOR H. P. PICKERILL, M.D., M.D.S.,

DIRECTOR.

March 31, 1913.

The Editor THE JOURNAL OF THE ALLIED SOCIETIES:

DEAR SIR: I was much interested in reading Dr. Gies' references to my work on "The Prevention of Caries" in your JOURNAL for December, which you kindly sent me, and wish to thank him for his kindly remarks. At the same time, I have no desire either to pose as a funny man or to be the innocent cause of your altering the title of your JOURNAL.

I very much regret to say that Dr. Gies' inferences are correct: that I was not acquainted previously with either your JOURNAL or Dr. Gies' work. You must ascribe it to my being in "far off New Zealand." I am continuing my work, more particularly in relation to the bacteriology and oral secretions of immune Maori children. If you in America could initiate a similar work it would be very useful. I should be glad to correspond with anyone who could undertake such investigations.

I hope to make a further report towards the end of next year. I am,

Faithfully yours,

(Signed) H. P. PICKERILL.

OBITUARY

MEMORIAL TO DR. WILBUR F. LITCH.

Wilbur F. Litch, D.D.S., M.D., an associate member of the American Academy of Dental Science, died at Philadelphia, December 25, 1912.

Dr. Litch was best known to our Society through his publications and his school work, for we missed to a large extent his personal contact with our members.

Throughout his long and useful life he was always laboring for professional betterment.

As a practitioner, he was able and skillful; as a teacher, scholarly and effective, and his loss is greatly to be deplored.

Be it therefore

RESOLVED, That we spread upon our records this testimonial of his worth, and record our deep sense of a great loss. And be it further

RESOLVED, That a copy of this resolution be sent to the dental magazines for publication, and a copy sent to his widow.

(Signed) EUGENE H. SMITH,

WILLIAM H. POTTER,

WALDO E. BOARDMAN,

BOSTON, March 27, 1913.

Committee.

NOTICES

NEW JERSEY STATE DENTAL SOCIETY

The forty-third annual convention of the New Jersey State Dental Society will be held in the Beach Auditorium, at Asbury Park, N. J., July 16, 17 and 18, 1913, beginning on Wednesday, July 16, at 10 A.M.

Oral hygiene and prophylaxis will be made a special feature. There will be essays on nitrous oxid and oxygen anesthesia and analgesia and extraction of teeth. These essays will be illustrated with moving pictures and stereopticon slides, and will be further exemplified in the clinics.

All ethical practitioners of dentistry and medicine will be accorded a hearty welcome.

The exhibits of modern dental appliances and the latest in office and laboratory equipment will be in charge of Dr. William H. Gelston, 40 North Thirtieth Street, Camden, N. J., who will be glad to furnish information regarding rates and space still available. Early application from those desiring to exhibit with us this year will be greatly appreciated.

The programs will be ready July 1 and will be mailed to all those sending their names and addresses to the Secretary.

EDWIN W. HARLAN, D.D.S., Secretary.

47 CRESCENT AVENUE, JERSEY CITY, N. J.

VIRGINIA STATE DENTAL ASSOCIATION

Editor THE JOURNAL:

MY DEAR SIR: I shall thank you to give notice in your JOURNAL that the next annual meeting of Virginia State Dental Association will be held, in conjunction with the Southern Branch of the N. D. A., at Old Point Comfort, Va., July 22, 23, 24.

Very truly yours,

C. B. GIFFORD, Corresponding Secretary.

OLD POINT COMFORT, VA., April 18, 1913.

MASSACHUSETTS DENTAL SOCIETY,

OFFICE OF THE SECRETARY, EVERETT, MASS.

At the annual meeting of the Massachusetts Dental Society, May 8, 1913, the following officers were elected:

President, Aurelius F. Wheeler, D.D.S., Worcester.

First Vice-President, Henry H. Piper, A.B., D.D.S., D.M.D., Somerville.

Second Vice-President, Dr. Adolphus F. Wyman, New Bedford.

Secretary, A. H. St. C. Chase, D.M.D., Everett.

Assistant Secretary, Charles M. Proctor, D.M.D., Boston.

Treasurer, Joseph T. Paul, D.M.D., Boston.

Editor, C. Edson, Abbott, D.D.S., Franklin.

AMERICAN SOCIETY OF ORTHODONTISTS

The next regular annual meeting of the American Society of Orthodontists will be held at the Congress Hotel, in Chicago, Ill., on June 30, July 1 and 2, 1913.

All ethical dentists who are interested in orthodontia are invited to attend this meeting.

FREDERICK C. KEMPLE, D.D.S., Secretary.

576 FIFTH AVENUE, NEW YORK CITY.

SUBJECT INDEX FOR JUNE, 1913

[Abbreviations: disc., discussion; rev., review; edt., editorial; ed., edition.]

- AMERICAN SOCIETY OF ORTHODONTISTS (notice), 194
- BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION, April 16th, meeting, 173
- Brannan, John W., Oral Hygiene, disc., 158
- CEMENT WITH AMALGAM, THE USE OF, Frank J. Ryan, on, 179
- Chayes, Herman E. S., on mouth conditions as related to pyorrhea, disc., 170
- Cronin, John J., Oral Hygiene, disc., 160
- Current News, 187
- DENTAL LAWS CONDENSED, by Alphonso Irwin, rev., 185
- Dental Society of the State of New York, Meeting of the, 93
- Dentifrices, Howard C. Kelly, on, 144
- Discussion on Oral Hygiene in Public Health Department and public clinics, 158
- “ “Some Observations on Mouth Conditions and Retention as Related to Pyorrhea Alveolaris from the Standpoint of the General Practitioner of Dentistry, 161
- Drying Root-canals (note), 180
- Dunning, William B., “Professional Journalism,” 140
- EAMES, G. F., on mouth conditions as related to pyorrhea, disc., 169
- Evans, George, on mouth conditions as related to pyorrhea, disc., 161
- Evans Museum and Dental Inst., 187
- FIRST DISTRICT DENTAL SOCIETY, S. N. Y., reports of meetings, 158, 161
- Flynn, Michael W., “President’s Address,” 136
- Fourth International Congress on School Hygiene, The, Aug. 25-30, 187
- Fourth International Congress on School Hygiene, edt., 174
- GILMORE, STEELE F., “A Method of Retention,” 118
- Gold Inlays, etching, to obtain better cement adhesion, R. I. Lewis, on, 180
- Grieves, Clarence J., “Some Observations on Mouth Conditions and Retention as Related to Pyorrhea Alveolaris from the Standpoint of the General Practitioner of Dentistry,” 96, disc., 164, 171
- HOWE, W. A., Oral Hygiene, disc., 158
- Hutchinson, Dr., on mouth conditions as related to pyorrhea, disc., 164, 169
- KELLEY, HENRY A., “Preventive Dentistry,” 123
- Kelly, Howard C., “Some Facts—Chemical and Otherwise—About Dentifrices,” 144
- LEWIS, R. I., “Etching Gold Inlays to Obtain Better Cement Adhesion,” 180
- Litch, Wilbur F., obituary, 191
- MASSACHUSETTS DENTAL HYGIENE COUNCIL, Oral Hygiene, outline for lecture on, 154
- Massachusetts Dental Society (notice), 193
- Massachusetts Dental Society, President’s Address, 136
- MOFFITT, J. J., “Radiographs in Canal Work,” 180
- Mouth Conditions, as Related to Pyorrhea Alveolaris, Clarence J. Grieves, on, 96
- Moxham, H. C., “Wax Inlays” (note), 180

- N. D. A. MEETING AT KANSAS CITY, THE, ed., 176
- New College Building, A, ed., 177
- New Jersey State Dental Society (notice), 192
- Notices, 192
- OBITUARY, Wilbur F. Litch, 191
- Oral Hygiene, Outline for lecture on, 154
- Oral Surgery, a text-book on, by Stewart Leroy McCurdy, rev., 182
- PAINTER, DR. CHARLES F., Dean Tufts Medical and Dental Schools, 189
- Pickerrill, H. P., letter from, 190
- Potter, Wm. H., "Sterilization of the Right Angle Hand-piece" (note) 181
- Practice of Dentistry, The, by L. and M. Greenbaum, rev., 183
- President's Address, Michael W. Flynn, 136
- Preventive Dentistry, Henry A. Kelley, on, 123
- Professional Advice (note), 179
- Professional Journalism, William B. Dunning, on, 140
- Pyorrhea, Treatment of Teeth, F. H. Skinner, on, 189
- RADIOGRAPHS IN CANAL WORK, J. J. Moffitt, on, 189
- Reports of Society Meetings, 158, 161, 173
- Retention, A Method of, Steele F. Gilmore, on, 118
- Rhein, Dr., on mouth conditions as related to pyorrhea, disc., 167, 169
- Ryan, Frank J., "The Use of Cement with Amalgam" (note) 179
- SIGNIFICANCE OF PUS IN THE MAXILLARY SINUS (note), 179
- Skinner, F. H., "Treatment of Teeth Having Pyorrhea" (note) 180
- Specialist, The (note), 179
- Sterilization of the Right Angle Hand-piece, Wm. H. Potter, on, 181
- VIRGINIA STATE DENTAL ASSOCIATION (notice), 192
- WAX INLAYS, H. C. Moxham, on, 180
- Wheeler, Herbert L., Meeting of the Dental Society of the State of New York, 93



DR. JOHN NUTTING FARRAR

THE JOURNAL

OF THE

ALLIED DENTAL SOCIETIES

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No. 3

THE N. D. A. MEETING AT KANSAS CITY

At the meeting of the National Dental Association, held in Kansas City, Mo., in July, the reorganization so much anticipated took place. It was thought that a large number of States would be prepared to enter the association on the new basis; but, owing to much uncertainty as to the meaning of various sections of the proposed new constitution and by-laws, only one or two States were fully prepared in every particular to come in on the proposed plan. After some changes in these "articles of organization," the difficulty was obviated for this year by a temporary change in the plan of representation. This change admitted but one delegate from each State to the House of Delegates, and the terms of these delegates expired with the adjournment of the meeting. Under this plan an entirely new House of Delegates will be organized next year. The proposed constitution and by-laws were found to be unworkable in so many instances that a blanket amendment was finally announced by unanimous consent, making it possible to amend any defects that may appear at the next meeting without laying the matter over for

a year. Although the House of Delegates was very much smaller than it will be in the future, it seemed necessary to occupy much of the time of the meetings in discussion.

It is evident that if many of the ablest and most interested members of the association are to serve in the House of Delegates and contribute to the scientific discussions, there should be some plan devised whereby the delegates may meet one or two days before the scientific meeting and devote all their time to business. Although there was wide diversion of opinion, there existed a spirit of loyalty to the welfare of the profession, which made it possible to settle most questions fairly and promptly, and to the general satisfaction of those present. It seemed evident that no one of the delegates was able to have his plans adopted at all times, and no one developed such a capacity for leadership as to direct at all times the policy of the meeting.

There were present, however, not a few who gave promise of unusual executive ability.

There was considerable impatience on the part of many present in regard to the establishing of a National Dental Journal, and the matter was so left that it is expected this organ of the society will be started by 1916, and possibly in 1915.

The interest excited by the fact of reorganization, a number of worthy projects and some noteworthy papers failed to attract more than the usual attendance at the National meeting. The work of the local organization committee was well carried out, and the Kansas City dentists and those in

that vicinity are entitled to great credit for the successful way in which the meeting was handled.

The work of Dr. Weston A. Price in establishing and organizing a foundation committee for scientific research is worthy of an article in itself. The spirit and high standard of those present was shown in the election of officers and Board of Trustees; men of known ability and sterling reputation being chosen in a vast majority of cases.

The National Faculties Association which met immediately after the National Dental Association took a new step, and voted to meet in the future in the winter, with the Pedagogical Society.

The next meeting of the National Dental Association will take place in Rochester, N. Y., July 14-17, 1914.

HERBERT L. WHEELER.

**JOHN NUTTING FARRAR, M.D., D.D.S.; HIS LIFE
AND WORK**

BY JAMES TRUMAN, D.D.S., L.L.D.

It is a difficult problem to measure the life and work of any human being, so involved in multiplied complexities is the checkered experience of humanity from the cradle to the grave; but the duty remains, and ever will remain, for survivors to spread the laurel wreath over the tomb, that passers-by may not forget that a great man or woman has lived and died.

It is presumed the average man would contend that the world has had a surplusage of great men and women, and, therefore, why add to the long and extended list running through the centuries? The answer to this may be that it is this very surplusage that has made the perfection of civilizations and, in the passing from earth of these, it becomes an imperious duty to explain to a hypercritical world, why these lives have been a part of the glories of the age in which they lived and worked.

The Farrars descended in direct line from a "distinguished warrior, Henricas Ferrarys, who accompanied William the Conqueror in the invasion and subsequent conquest of England A. D. 1066. The armorial bearings granted to this family (probably by the above-named Monarch) are on record in the College of Heralds in London, and tradition has it that Ferrarys was chief of Horsemen in William's Army, an assertion borne out by the horseshoes on shield and crest. The motto, 'Ferre va Ferme' (Firm as Iron) was given to the father of the above in Normandy, France."¹

These statements are interesting, not from the fact that in the far distant past a nobleman of the Farrar family served a king, but the evidence this incident affords, to the thinking mind, that the well-known law of mental progression finds its full realization in the history of this family. It requires a hun-

¹ From William H. Abbott, Esq., Genealogist, New York City.

dred generations to make a fully developed man or woman.

The history of the Jewish race is very instructive in this respect, and the gradual evolution of this great people to become the leaders in literature, art, science, finance, and history, is one of the marvels of the world. While this is true and full of honor to the race, it is equally true, that, as a people, they have never been celebrated in the mechanic arts. They have never produced a Benvenuto Cellini, and, for the excellent reason, that this people, from generation to generation, were engrossed with culture of the mind rather than with that of digital skill.

John Nutting Farrar was born April 24, 1839, in Pepperell, Mass. His birth was somewhat of a surprise, his mother being forty-five years old. His health was far from satisfactory in his earlier years, indeed there was little to build upon in this respect, from his birth; but his work on the farm, in after years, made him fully as robust as his brothers.

Dr. J. N. Farrar's mother was Rebecca Parker, daughter of Deacon Jonas Parker, of Pepperell, Mass. Jonas was the son of Deacon Edmond Parker. The latter was the man who left his plough and team on the field and ran to his house, secured his gun, joined the Pepperell Company of Minute Men and hurried to the battles of Concord and Bunker Hill. The plough and chain are still kept as heirlooms at Pepperell, Mass.

Years have rolled by, but while writing of this scene in the ploughed field, the present writer's mind vividly recalls the days when the cry went up throughout the North, "Fort Sumter has been bombarded and fallen!" Philadelphia for days was crazed with excitement. Work was left untouched, anxiety was depicted on every countenance. Men were rushing to arms everywhere, but, alas! there were no arms. The writer, like the rest of disturbed citizens, was on the street. Every one was asking his neighbor, "How was Washington to be saved?" There was no answer. As the crowd swayed to and fro in excitement, drums were heard, and in the distance a regiment of a thousand men, with bayonets glittering in the sun and with steady alignment and the step

of veterans came on regardless of the cheers of the excited crowd. The cry went up, and repeated by a thousand throats: "The men of Massachusetts are coming!" In the rush the writer was carried along to greet the Sixth Massachusetts, descendants of the men of Bunker Hill, on their way to rescue the Capitol of the Republic. On, on they marched, amid the continuing cheers of an enthusiastic and admiring crowd. Has not the history of this famous regiment been written elsewhere? Its advent in Philadelphia can never be forgotten by those who witnessed it.

Over fifty years have passed since that day and war's alarms are over, never, it is hoped, to be repeated. At the present writing "the Blue and the Gray" are shaking hands, while the dove of peace is triumphantly flying over the blood-stained acres of Gettysburg. Disunion of the States, may it never more be repeated. Truly does it take many generations to make great men!

Dr. Farrar had several brothers—one became a banker, another a physician, and the other a professor in Vassar College.

Dr. Farrar began to attend school at the age of three years, as did all New England children at that time, "but not until he was thirty-four was his school education finished."

In his early life, when not at school, he worked on the ancestral estate, then belonging to his father, until he was about twenty-four years of age.

His natural artistic tendencies and æsthetic tastes were very apparent, probably to the disgust of his more prosaic family who could not appreciate the decorating of walls in his father's house with burnt stick sketches.

These same tastes led him to beautify the farm by transplanting forest and other trees, "thus making it one of the most beautiful in New England." The farm work not only developed his physique, but roused that remarkable latent inventive faculty, that in after years, made him prominent in many directions. He made many improvements in agricultural appliances.

He was educated in the village school and town academy until he was nearly twenty years of age.

At the age of twenty-two he became a member of the "Socratic Class," under his brother, Prof. Charles Farrar, at Elmira, N. Y., observatory, where he acquired extensive knowledge of higher mathematics, astronomy, geology, analytical chemistry, etc.

While living at Pepperell he was appointed Justice of the Peace by the Governor of Massachusetts, a position his father had held for many years before him.

Because of a desire to see more of the world than was confined to the environs of Pepperell, after some difficulty, he raised twenty-four dollars and started for what was then the Far West. He managed to reach Galesburg, Ill., with only five cents and no breakfast in sight. It was Sunday morning and he met a benevolent-looking gentleman, who, after hearing the story, took him to his own home. The next day he sought work, and he finally secured employment on the railroad, where he remained as a handy man on one of the trains running from Peoria to Burlington (ninety-five miles). This was in 1857 when John was seventeen years of age.

Dr. Farrar's great love for mechanics undoubtedly led to his being attracted to dentistry, as there is no evidence that he was prepared by association, or otherwise, for that profession. His one desire seemed to be to enter a dental college.

One of the most successful of these was, at that time, the Pennsylvania College of Dental Surgery, located in Philadelphia, Pa.

After many difficulties he was enabled to start for that city with the munificent sum of twenty-five dollars, to secure a professional education that necessarily involved the expenditure of several hundred. The beginning of his entrance to this new life, while interesting, is too lengthy for insertion here; suffice it to say, "That after buying some clothing in New York City, and paying railroad expenses," he landed in Philadelphia with about ten dollars. "I called upon the dean of the college, and stated: 'I have come to inquire if you will be willing to give advice to a young man, without means, but

anxious to take up the study of dentistry?" He then related his story and the interest of the dean, Prof. C. N. Peirce, was aroused and he took the matter under consideration. The next day he informed the impecunious but determined applicant that he had secured a home for him, and directed him to a Quaker lady, whose kind sympathies had been awakened in his behalf. He was placed in a room with another student, a Mr. Baxter, who subsequently became a prominent dentist of Albany, N. Y. He managed to secure a few instruments, and after giving his note for tuition fees, he was regularly installed as a student. Before the term was finished, a near relation died, leaving him three hundred dollars, and an uncle made him a gift of a hundred more, so that he was able to liquidate all indebtedness. Between the sessions of the college he earned an additional eight hundred dollars, thus giving him means to carry on his studies without further financial stress. The following spring he went to Curaçao, W. I., remaining there four months, practising in the families of government officers who had sent for him and who had secured for him an extensive clientele among the better class of natives.

At his mother's request he returned home to care for her in her declining years. This involved a renewal of the old farm life, practising his profession as opportunity offered. Dr. Farrar held to the opinion that the dentist of the future would be required to have a more thorough education in collateral branches of medicine than was possible in dental schools. This determined him to take a full medical course, and he matriculated in the Jefferson Medical College of Philadelphia. He graduated from this school with high honors in 1873-1874. He was, at this time, thirty-four years of age.

He was appointed Lecturer on Operative Dentistry in the Pennsylvania College of Dental Surgery in 1877. He was also subsequently appointed as Lecturer on Orthodontia in the Baltimore College of Dental Surgery.

On October 23, 1867, he married Sarah W. Chandler, daughter of William Chandler, and his wife, Rachel Fritts. One son, who died in infancy by accident, followed this union. No further additions to the family took place in succeeding years. Mrs. Farrar is still living.

It has been already stated that at a very early age he gave evidence of an artistic taste as manifested by his charcoal drawings on walls. This continued throughout life. Dr. Farrar was always ready with pen, pencil and chalk to delineate his mechanical ideas. He could not deliver a lecture without this aid.

He was equally anxious to write his views on various subjects. His study of the natural sciences with his brother at Elmira, N. Y., as previously stated, led him to write on "Cycles and Beauties in Nature," and also "From Star Dust to Man" (astronomy). It is said he attempted one or more novels, but the present writer has no knowledge of these, and they, probably, never reached the public.

While the writer's statement made some years ago, that Dr. Farrar was the real father of what is known as Orthodontia, may be disputed, and perhaps with reason, it still remains true. Regulating teeth was practised long before Dr. Farrar's advent into dentistry by the present writer and others, but there can be no dispute of the assertion that the general efforts in this direction were exceedingly crude and without system. Certainly the knowledge displayed was not as advanced as that subsequently shown by Dr. Farrar, or possessed at the present day by Angle, Jackson and others.

Dr. Jackson, one of the most famous writers on Orthodontia, said of Dr. Farrar at the banquet given in the latter's honor in New York City, March 21, 1908: "Dr. Farrar formed a link in the chain that has been wrought in our profession, and we would not have had the Orthodontia we find to-day if it had not been for the work of this honored guest. . . . The man who does not follow up and read carefully Dr. Farrar's writings and the principles laid down years ago is making one of the mistakes of his life."

Dr. Farrar was the originator of the theory of "Intermittent Force" in regulating teeth, as being not only the proper method physiologically considered, but as proving the most effective.

He drifted into this work in 1875 and became the leading writer on "Irregularities of the Teeth and Their Treat-

ment." His articles, principally in the Dental Cosmos, were sharply criticized by the older dentists, who were slow to believe that those original pen-and-ink drawings were more than imaginary. Time came to the defense of Dr. Farrar, and the world of dentistry was aroused to comprehend that a new teacher had been cast into the arena of practical experience, and that the dentists of the future must stop, think and learn new lessons of wisdom.

He held advanced ideas also, regarding certain pathological conditions, such as the treatment of alveolar abscess and radical views, at this time, in regard to the treatment of the antra. These were published, at a later date, in the *Missouri Dental Journal*.

His floating articles were widely distributed. They may be found in the *Independent Practitioner*, *International Dental Journal*, *Brooklyn Medical Journal* and *Correspondenz Blatt*, of Berlin, Germany.

It was, however, Dr. Farrar's crowning glory and honor to have been the author, after fifteen years of labor, of three volumes, entitled a "Treatise on Irregularities of the Teeth and Their Correction." It contained two thousand illustrations, not embracing those of the third volume, and was published in 1888.

The author's aim in these volumes was to make every appliance self-active, at the same time the dynamics being such that the patient would be practically unconscious that regularity was taking the place of irregularity in the mouth.

The cardinal principle underlying all of Dr. Farrar's work in this direction is abundantly shown by this quotation from the "Preliminary Chapter" of his work. He says, "One of the cardinal principles, especially advocated in this work, is the importance of the observance of the physiological law, which governs tissue action during movement of teeth (by means of art), the object being to prevent pain. To insure this result (exemption from pain), the pressure by which the movement is to be effected, should be mainly under the control of the patient, a requirement which implies the use of instruments capable of being operated and adjusted at will.

. . . The idea of taking advantage of the functional laws of the tissues, to prevent pain, appeared to me (at the time it was presented) novel, and yet so rational that, when fully appreciated, it would be available in general surgery as well as in dentistry. To determine this rate [of movement] and test its value, I made a series of experiments which extended over a period of several years. These results were made known to several professional gentlemen in 1873, and in February, 1874, this topic was the subject of the graduation thesis at Jefferson Medical College."

He says further in relation to the force developed by the screw and its peculiar adaptation to the needs in regulating teeth, that "When I first made the broad statement that the screw was capable of being used in more forms than that of the screw-jack, and that the screw might yet be made to play an important part in the correction of nearly all conditions of irregularity, the assertion was said, by many, to be absurd. Even the screw-jack now admitted to be adaptable to many conditions with wonderful results, was then thought to be capable of very limited service."

His writings drew attention from all parts of the civilized world, and he could have been kept busy, the rest of his life, answering continually extended invitations, but he preferred to talk with his pen.

The third volume, while long since finished and ready for the press, remains in manuscript. Dr. Farrar wrote the present writer some months before his decease, requesting his aid in securing help to publish it, the expense being some five thousand dollars. The effort was made, but it availed nothing. It is to be hoped that this volume may not be allowed to perish for want of the necessary funds to complete it.

Dr. Farrar was a member of various scientific societies. The list embraces the following:

New York County Medical Society.

Medical Society, County of Kings.

Anatomical and Surgical Society.

Sanitary Society.

Philosophical Society of Brooklyn, N. Y.

American Dental Association.

Brooklyn Dental Society.

First District Dental Society of the State of New York.

New York Odontological Society.

Metropolitan Museum of Art.

National Dental Association.

His scientific training naturally led Dr. Farrar to broader views of life than those generally held, but his kindly disposition kept him from open antagonism with those differing from him. He evidently held to the wise view, that all changes in mental development must be by the very slow process of evolution, through the gradual infusion of scientific truth into the mind before its final adoption.

His religion was essentially Unitarian. He was a great admirer of Theodore Parker, a descendant of the Parker branch of the family, and a celebrated liberal clergyman of Boston. He attended quite regularly Henry Ward Beecher's church. His liberality was sufficiently extended to take these apparently opposite extremes of theological faith, into his religious storehouse, confident that in the final analysis, there would be found no difference in their component parts. His own words best express his religious conceptions, for he says: "The intelligence behind all is quite equal to all phenomena in nature, without the interposition of the miracles. That the so-called mysteries of nature are the result of causes, perhaps, not now fully understood, but which will be made clear in the future of scientific thought, already far advanced toward the solution."

His philosophic mind naturally led him to become deeply interested in the works of Spencer, Mills and Huxley, but while absorbing much, he did his own thinking and was never a parasite in mind.

In 1891, on account of his health, he bought a Dutch built stone and wood house, some two hundred years old, at Harrington Park, Bergen County, N. J. This he improved and embellished to suit his artistic taste, planting trees and shrubbery to give it character. He added to this by purchase of lots, so that in the end, he had a home, large and separate

from all disturbing elements. This he called his "Nutshell," an appropriate name, where he could retire from the rush and worries of New York City and a perplexing practice.

Dr. Farrar's retiring disposition led him, after the completion of his three great volumes before alluded to, the third yet unpublished, to retire, apparently, from the gaze of the world. This is to be regretted, for the profession needed his ever active mind, more than than at an earlier period. He ever avoided professional antagonisms, and it is possible that to this was due his retirement within himself, for about this time there was much contention as to principles and methods in Orthodontia.

His friends, however, determined to force him from his retirement, and gave him a banquet at the Hotel Brevoort, New York City, March 21, 1908.

At this banquet Dr. Farrar explained his position as to specialties in dentistry, in a way worthy of remembrance. He said: "I regard the profession of dentistry as equal to any profession in the world. Is there any profession or any branch of medicine that can relieve the amount of pain and suffering that we do? I think not. I have always made my study of the profession as a whole, and am an all-around dentist today, have practised every part with equal knowledge. I have no specialty, unless all the branches are specialties and altogether amount to a great specialty called dentistry. I cannot understand how any one can undertake to be a specialist in dentistry who is not an all-round dentist. . . . I advise young men to learn all branches of dentistry equally well, and never give up the other branches to follow a specialty. If a dentist thinks he can follow a certain line better than any other, he can get a reputation as a specialist, but no man can treat a particular branch successfully unless he is master of every branch of the profession beforehand. . . . Some years ago I told some of my friends what fees I received, and I received letters from all over the United States on the subject. I told my correspondents that they came because I satisfied my patients. . . . In one case I charged the patient one thousand dollars, and he paid me five thousand, because he felt thoroughly satisfied with the work."

Dr. Farrar's mind naturally turned toward mechanics. Invention of machinery to aid operations was so marked a trait of his character, that it was said of him that he could invent machinery as easily as a man could read a book.

This inventive faculty gave him the power to master intricate problems in mechanics, and furnishes the key to his remarkable success in preparing appliances for his orthodontic work in after years.

This talent brought him often in consultation with inventors to aid them in procuring "letters patent," in which he was regarded as an expert. Among his inventions were elastic car wheels and a typewriting machine, the first typewriter built in America. This was intended as a present to Professor Robley Dunglison, of Jefferson Medical College, Philadelphia, but because of the early death of Dr. Dunglison it never reached that gentleman.

This inventive ability led to a multitude of appliances for regulating teeth, and of such a character that it is not surprising they roused the incredulity of the dental profession. On one occasion the writer was favored with a visit from Dr. Farrar, and he exhibited a tangled mass of orthodontia appliances as large as a good-sized orange, all of 18-karat gold, and all had been used in cases. It was an impressive sight.

There are last hours to every individual on earth, some are long in reaching the goal appointed for all, and some pass the confines all too suddenly and leave a lasting shock that continues as the years pass into oblivion. This was true of Dr. John Nutting Farrar, who died from cerebral hemorrhage June 12, 1913, at 1271 Broadway, New York, his city home.

He was at work at his chosen profession as late as Wednesday, the 11th, filling teeth; and on Thursday morning, 1.30 A. M., he had passed from mortal life.

He was buried in the family lot at Pepperell, Middlesex County, Mass., in the vault his foresight had prepared long before, and upon which he had erected a monument to carry the family name to many generations.

Thus ended the life of one of the great thinkers and workers in dentistry. The nineteenth century had many, but in

that extended line, the one who for original conceptions and appreciation of his professional work, stood almost alone. His prescient ability foresaw that dentistry could not be successfully carried on with a partial degree and its equally partial knowledge, and he set the example, as did many others, of taking his medical degree in one of the best of American schools. He never attempted to explain how the dental profession, as a whole, could attain this, and the problem is still one that must be met by the best minds in the dental ranks; but come it must, for dentistry simply as a specialty in the great healing art is as unthinkable as the specialty of orthodontia, without a thorough knowledge of dentistry as a whole.

The personality of Dr. J. N. Farrar will grow dim as time recedes into other succeeding years and centuries, but the principles he laid down in his immortal work will not only live, but will, in time, become truisms, although their origin may have been forgotten; for truth is eternal as is the universe of life in the evolution of Nature.

SOME ESSENTIAL FACTS PERTAINING TO THE CONSTRUCTION OF ANATOMICAL DENTURES¹

BY JAMES HARRISON PROTHERO, D.D.S., Professor of Prosthetic Technics, Prosthetic Dentistry and Metallurgy, Northwestern University Dental School, Chicago, Ill.

The degree of success attained in the construction of anatomical dentures is directly proportional to the prosthetist's ability to recognize and record the mandibular movements of each individual patient.

Probably no two human beings ever existed whose muscular actions, or mandibular excursions, were identical. If such movements were alike, the problem would be simple.

It is only within recent years that the action of the mandible in masticatory effort could be recorded with any degree of certainty, and these records utilized in denture construction, because of lack of suitable and accurate registering appliances.

Due credit should be given Bonwill for having conceived and partially developed a method having such potent possibilities for usefulness; and to Boditch, Luce, Walker and others, for advancing the research work in mandibular movements. The practical application of the findings of these men to denture construction, however, has come within recent years.

Gysi, of Zurich, and Christensen, of Copenhagen, have each devised methods of recording the condyle movements in masticatory effort, both of which are capable of practical application, and at the present time represent the most advanced and accurate means known for accomplishing the end in view. Of the two, Gysi has worked out the most elaborate and scientific system yet originated, embracing valuable points not included in Christensen's method—a system which, if followed in detail, cannot fail to yield most excellent results. His presentation of it in the *Dental Cosmos* in 1910, is a classic of its kind, and up to the present, represents the highest attainment of human effort in solving one of Nature's very complex problems.

¹ Read before the First District Dental Society, S. N. Y., January 6, 1913.

Unfortunately, few in the profession have familiarized themselves with anatomic methods, and fewer still with the Gysi system, considering it too complicated to put into everyday practice. I believe if the technical procedures were briefly, but clearly, outlined, and all theory except that absolutely essential to the carrying out of these details segregated, a working knowledge of the system could be acquired by any one with reasonable application. Lack of understanding or appreciation on the part of the profession for his methods, has led Dr. Gysi to devise a conventionalized occluding frame which is much less complicated; but, on the other hand, decidedly more limited in its range of application than the one described in his paper of 1910.

Briefly stated, the problem of denture construction may be worked out by several methods with varying degrees of success, as stated in the opening paragraph of this paper. These, the order of presentation corresponding with the accuracy and value of each, may be outlined as follows:

The Gysi System.

An approximately correct registration of the condyle paths and rotation centers of the mandible of each patient can be secured with the Gysi system, and these very essential, elemental factors utilized in constructive processes by means of his appliances.

The principal disadvantages of this method lie first in its *apparent* complexity, and, second, since the technic is made up of various steps, unless these are carefully carried out, inaccuracies will creep in, which will lower the quality of the final result. Neither one of these objections presents any serious difficulty to the sincere seeker after truth. The cost of the appliances is the most serious obstacle to the introduction of the method in schools, but this should not deter practitioners from taking up the work. I am satisfied that in time it can be introduced in schools as a requirement.

The Christensen-Snow Method.

An approximately correct registration of the condyle paths of the patient can be secured by the Christensen method,

and this record utilized by mounting the casts on the Snow occluding frame with the face bow, and setting the condyle paths to correspond with the record. The rotation centers of this frame are fixed at four inches, the average distance between the rotation centers of the mandible in the human subject.

This appliance has no incisor guide, as has the Gysi apparatus, for determining the proper angle of inclination to overbite the lowers. This objection may be overcome, first, by having only a slight overbite, and, second, by grinding and trial of the teeth while adjusting in the wax.

The principal advantages of the method lie in the fact that the apparatus is less complicated, as well as less expensive. It involves fewer steps, and consequently fewer errors are liable to occur. A working knowledge of the method is not difficult to acquire, and the results attained by the beginner, even in first efforts, are usually so gratifying as to lure him on to greater efforts.

The Gysi Simplex Method.

This new model frame has fixed condyle paths set at an inclination of 35 degrees and fixed rotation points three and five-eighths inches apart. It also has an incisor guide similar to the one on the more complex Gysi apparatus.

I take the liberty of quoting a few paragraphs from the literature accompanying the appliance from which to draw conclusions:

"The Simplex articulator is a device for more perfectly articulating artificial teeth according to the requirements of the average mouth. Human jaws differ widely in their movements, and in the effect of those movements on the articulation of artificial teeth.

"The more ambitious dentists will desire to record the exact movements of the jaw in the case in hand, and to articulate the teeth according to the individual requirements. But to the minds of many dentists such recording of individual movements and articulating of teeth to meet them is a rather tedious process, and they are unwilling to undertake it.

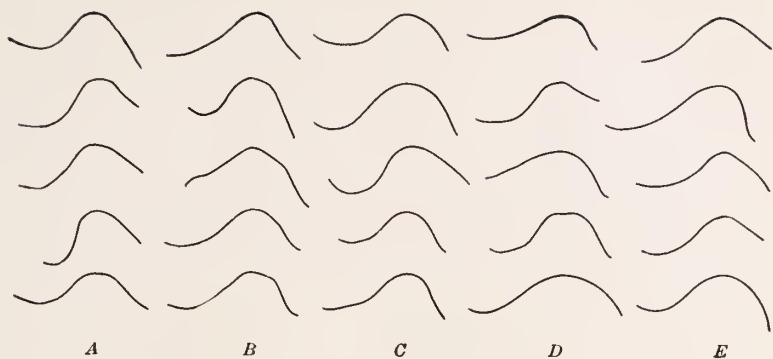


Fig. 1. Graphic outlines of glenoid fossæ, left side, after Tomes and Dollimore

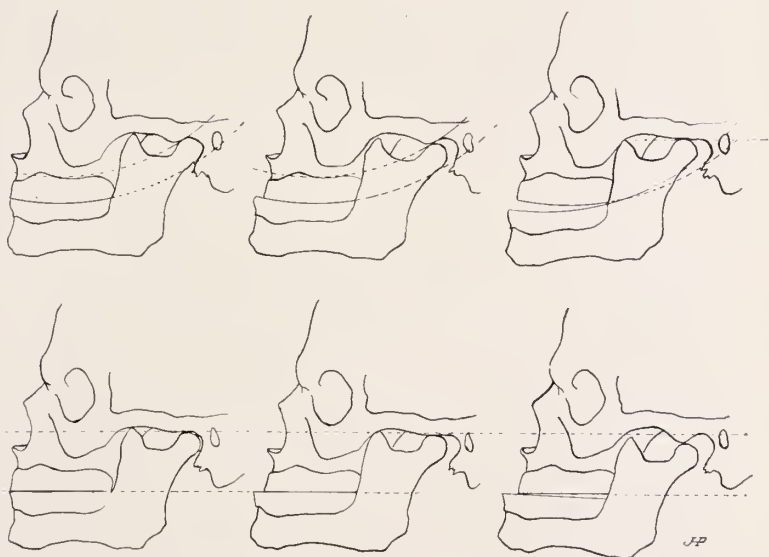


Fig. 2. Diagrams illustrating co-ordinate and inco-ordinate action resulting from a parallel or divergent relation between the condyle paths and planes of occlusion of the base plate



Fig. 3. Bite stem inserted in upper wax rim



Fig. 4. Adjusting the face bow
Tightening the bite clamp



Fig. 5. Face bow carrying bite-plates adjusted to frame

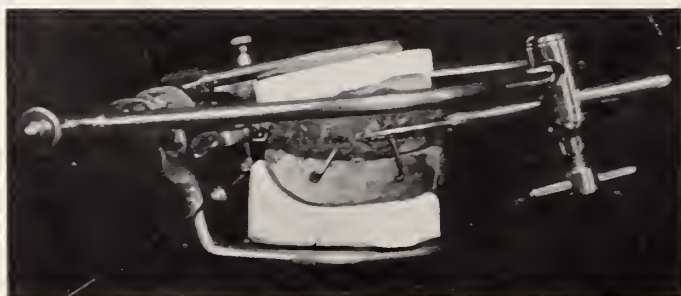


Fig. 6. Models adjusted in base plates ready for mounting to frame

" There is something to be said on the side of dentists who demand shorter cuts and more rapid methods. For, while the inclinations of condyle paths vary through a wide range from very slightly inclined to the very steep, two-thirds of them seem to group themselves between inclinations of 30 degrees and 40 degrees, with 35 degrees as the average.

" In the Gysi Simplex Articulator the requirements for a simple and scientific instrument have been met in a degree heretofore unknown. There is nothing to adjust. Everything is set. No measurements are to be taken on the patient, and no adjustments made on the articulator save the simple one of mounting the models in proper position."

Now, let us analyze some of these statements just quoted.

First, the Simplex is a device for more perfectly articulating teeth according to the requirements of the average mouth. This may be correct in those cases where the condyle paths are both equally inclined at an angle of 35 degrees. If either one or both varies from that angle whether more or less inclined, it is not an accurate or scientific device for that case, and its accuracy decreases in direct ratio to the variance of the condyle paths from 35 degrees.

In my own experience I have found the condyle paths varying from horizontal to an angle of 60 degrees. In the same patient the condyle paths are seldom the same, variations of 10 degrees being quite frequent. How then can a frame with fixed paths be called a scientific appliance when it will answer for only one class of cases?

Again, the literature states that the more ambitious will desire to record the exact movements of the jaw. This of itself is a tacit admission of its limitations, and therefore not broadly scientific. The side movement of the frame in reproducing masticatory movements may be of some value and prove serviceable in practice, but it certainly does not begin to compensate for the lack of condyle adjustments.

In an experience of nearly six years with the Christensen method and the Snow frame, in which there is no provision for a side movement, I have yet to note a single case where the occlusion of the artificial teeth was interfered with to any appreciable degree by lack of such movement.

One familiar with anatomic methods can scarcely conceive how such an appliance could be introduced with the hope that it would be adopted by the profession, and by the results derived from its use prove an incentive to more exact technic. Its introduction will do infinitely more harm than good. It will exert a retarding influence on the growth and development of the more exact present day methods, which are gradually, but surely, being adopted. I do not wish to cast any aspersions on the ability of the designer. His previous efforts in this field bear the imprint of a master hand, but in the light of our accumulated knowledge and with our present day appliances, the Simplex Articulator is a travesty in the anatomic field.

Gritman-Snow Method.

Casts are mounted on the Gritman frame with the Snow face bow, the condyle paths of which are fixed at an angle of 15 degrees. The rotation centers are also stationary, and the average distance of four inches apart. Occasionally, fair results in anatomical movements are secured, but in most instances considerable modification by grinding is required, while at times dentures capable of normal lateral movements cannot be developed, either in the constructive steps or by modification.

Plane Line Articulators.

Casts are mounted on a plane line or any ordinary frame. The teeth may be occluded accurately and look well from an esthetic standpoint, but can only be used with the hinge motion. This is the old system, and unfortunately, to a great extent, the prevailing method. Any self-respecting dentist will discard this old time method which, although it has, to a certain extent, fulfilled a purpose for want of a better, is capable of restoring the function of mastication only partially.

Advantages of Anatomical Methods.

It is not generally known that food can be masticated more thoroughly and with much less effort when subjected to lateral anatomic movements, than when the thrust or

hinge movement alone is employed. The following table by Dr. G. V. Black and Dr. Joseph Head illustrate this very clearly. Dr. Black's experiments with the phago-dynamometer were made to determine the amount of stress necessary to reduce food with the direct thrust, and were published in the Dental Cosmos in 1895. Dr. Head's experiments were conducted with a human masticatory apparatus (skull, with mandible in position), in which the lateral movements were employed and were published in the Cosmos in 1906.

	<i>Dr. Head.</i>		<i>Dr. Black.</i>	
<i>Meats.</i>	<i>Pounds.</i>		<i>Pounds.</i>	
Corned beef.....	18	to 22	30	to 35
Tongue	1	to 2	3	to 5
Tenderloin of beef, very tender.....	8	to 9	35	to 40
Round of beefsteak, tough.....	38	to 42	60	to 80
Roast beef.....	20	to 35	35	to 50
Boiled ham.....	10	to 14	40	to 60
Pork chop.....	25	to 30	20	to 25
Roast veal.....	16		35	to 40
<hr/>				
Average	17	to 20	32¼	to 41⅞
<i>Vegetables.</i>				
Raw cabbage.....	16		40	to 60
Head lettuce.....	8		25	to 30
Radish, whole, brake at.....	20	to 25	20	to 25
Radish, pieces, pulverized at.....	10	to 15	35	to 40
<hr/>				
Average	12½	to 16	30	to 38¾

Another decidedly important advantage is that dentures occluded anatomically *balance* when subjected to lateral masticatory effort. This one fact alone should commend the method to every practitioner who has the interest of his patients at heart.

The argument advanced against this statement by those unfamiliar with the method, is that no balancing contact exists between the upper and lower dentures when a large bolus of food is held between the teeth on one side in the initial act of mastication. This is true, but patients should be instructed to divide their food into morsels of medium size before introducing into the mouth. As a matter of fact, patients using

properly constructed anatomical dentures do not experience any difficulty in this line.

Another advantage of importance is that the lateral swing of the mandible is the normal masticatory movement. The anatomic method is the outcome of the prosthetist's efforts to imitate nature as nearly as may be possible. Experience has demonstrated that these efforts are fraught with beneficial possibilities to mankind, undreamed of by the inexperienced.

With no intention of depreciating the earlier work of Dr. Gysi, my efforts to-night will be confined to elucidating a few of the essential points in the Christensen-Snow method of denture construction.

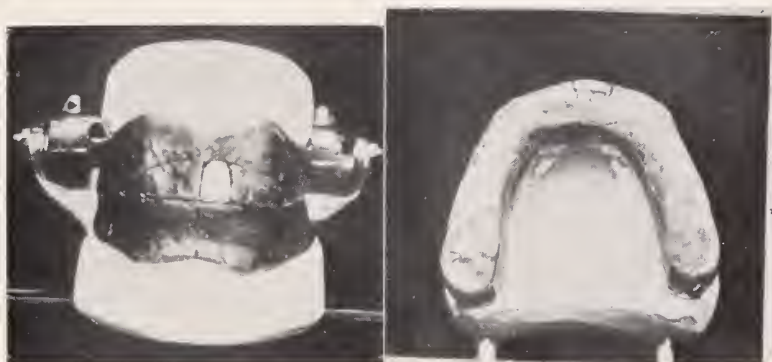
A brief outline of each step will be given, and the main points enlarged upon when necessary.

Base Plates.

Assuming that good casts of each arch have been secured, a base plate should be fitted to each. These may be of vulcanite, metal, or special Ideal Base Plate. In any case, they must be unyielding and not affected by the stress of trial in the mouth.

On these base plates, rims of moderately hard wax, about 10 mm. broad, are built up to represent approximately the length of the teeth in the finished denture. They should be formed with flat occlusal planes, and be made to approximately restore facial contour. These contour models are fitted in the mouth, and care taken to see that uniform bearing on each border is secured when the rims are in contact.

The high and low lip lines, and the median line of the face should be distinctly marked on the wax rims, for reasons that are obvious. Facial contour is developed at this time, since the outer surfaces of the wax indicate the correct position for the labial and buccal surfaces of the teeth during their arrangement. The upper base plate should now be removed from the mouth, the bite stem of the face bow heated and inserted in its correct position and withdrawn, as its weight tends to displace the base plate while taking the bite.



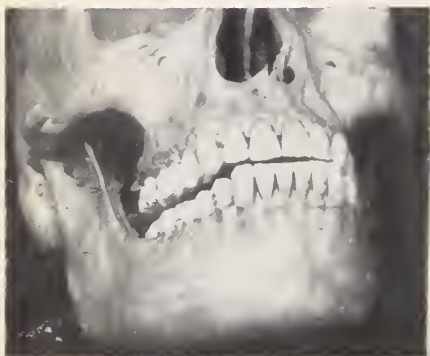
Figs. 7 and 8. Labial and incisal view of the first central incisor in position



Fig. 9. Placing the first tooth in the lower arch



Fig. 10. Contact of the buccal and lingual marginal ridges on the working side of the mouth. Right side shows balancing contact



Figs. 11 and 12. Note the broken contact in both natural and artificial teeth on the balancing side of the mouth until the last molars above and below find contact on account of their occlusal surfaces being parallel with the line of movement of the condyles

Locating the Condyles.

Before proceeding to take the bite, the ends of the condyles should be located so that later the face bow may be correctly applied.

The base plates being in position in the mouth, the ball of the index finger is placed at a point about 12 mm. in front of the external auditory meatus and on a horizontal plane with its upper margin. The idea is to place the finger so as to rest on the rim of the glenoid fossa, as well as over the condyle end. This position of the finger enables the operator to detect the first movement of the condyle when the mandible is opened and closed. The integument opposite each condyle end is dotted with a soft lead pencil or a piece of sharpened chalk.

Taking the Bite.

Two methods, or a combination of the two, can be relied upon for securing the correct antero-posterior relationship between the upper and lower jaws, the bite plates having already established the perpendicular distance. Tired masticatory muscles tend to bring the condyles into a normal position of rest in the glenoid fossæ. Accordingly, the patient is instructed to open and close the jaw rapidly a number of times, then gradually more slowly and with a slight period of rest between each effort. Meanwhile the operator should hold the patient's lips apart, and note the striking of the wax rims until the same contact is secured with each closure, when the bite locks can be inserted.

The other method which should follow the one just described if the desired results are not obtained, consists in having the patient relax the muscles to allow the operator to manipulate the mandible. The ends of the fingers and thumb grasp the point of the chin, and in this manner open and close the mandible, slight backward pressure being exerted at the same time. When the correct relationship is found, the patient is instructed to keep the jaw closed while the bite locks are set. The patient should not be impressed with the importance of the step being carried out, as abnormal movements are more apt to occur.

The Face Bow.

The face bow is a caliper for registering the relationship between the alveolar borders and the condyles when at rest in normal bite position, and in conjunction with the bite plates a similar relationship is established between the alveolar planes of the casts and the rotating points of the occluding frame. It is practically indispensable in anatomic work. Its use insures the placing of the teeth on the base plates, the correct radial distance from the rotating centers of the mandible.

Adjustment of the Bow.

The bite stem is returned to the groove in the upper wax rim from which it was removed before taking the bite, pressed firmly to place and secured by melting the wax slightly at two or three points. The condyle rods of the bow are loosened and drawn out full length. The large clamp is passed over the bite stem, and the condyle rods dropped down until opposite the condyle ends. The condyle rods are then pressed in against the integument over the pencil marks previously made, and the bow adjusted so that the same number of graduations show on the projecting inner portions of the rods. If not evenly balanced, the casts will be thrown to one side of the median line on the frame. When adjusted evenly, the condyle rods are fixed by their respective clamps. The central clamp is now tightened, which fixes the relationship between bite stem and bow.

Removal from the Mouth.

The clamps of the condyle rods are loosened and the rods drawn out, the patient is instructed to open the mouth, and the bite plates are usually removed without difficulty, the bite stem being used as a handle.

Transferring the Base Plates to the Occluding Frame.

On removal, the condyle rods are thrust in their full length and the clamps tightened, which brings their inner ends close enough to engage with the hinge projections of the

frame, representing the condyle ends. The occluding frame is set upon the tin base to prevent it tipping backward, and the upper portion thrown upward to permit the ready adjustment of the upper cast. The ends of the face bow are slightly drawn apart, and the condyle rods allowed to spring in on the projecting points of the frame.

If the crescent plate of the bite stem has been placed parallel with the occlusal plane of the upper bite plate, the raising of the face bow to a position parallel with the table on which the frame sets will establish the correct horizontal relationship between the base plates and the occluding frame. This is accomplished by placing a block of suitable height anteriorly under the large clamp nut to support the bow.

Mounting the Casts on the Occluding Frame.

The upper cast is set in position in its base plate, and fixed by luting it at two or three points with wax to hold the correct relationship. The upper bow of the frame is dropped down in position, and plaster applied for attachment. When set, the whole apparatus is inverted, the low portion of the frame turned back and the lower attached in a similar manner to the upper cast. When set, the face bow is removed.

Another method of holding the casts consists in wiring them firmly together, each being in its respective base plate, and the wire encircling both before the application of plaster to either one.

Recording the Condyle Paths.

Now comes a step which, in my opinion, is the most important of any in anatomical denture construction—the *recording of the condyle paths*. The base plates are removed from the cast, and the two bite gauges inserted on the occlusal planes of the lower bite plate about 16 mm. in front of its distal termination. The object in placing them in this position rather than at the extreme distal ends, as is commonly done, is to prevent the displacement of the lower base plate, it having a tendency to slide forward, since in the initial act of closing there is no contact between the upper and lower wax rims anteriorly.

The patient is instructed to protrude the lower jaw and bite until contact is secured in front. Two bite locks are then applied in the buccal region, and one on the labial surface, to maintain the relationship of the bite plates in their protruded position. From 3 to 5 mm. protrusion is usually necessary to secure an approximately correct registration of the angular inclination of the paths. The bite plates are then removed, and in order that the relationship be absolutely maintained, the wax rims may be luted at several points with a hot spatula.

Setting the Condyle Paths of the Frame.

The clamps controlling the condyle paths of the frame are now released and the back spring unhooked, which allows free movement of the two portions of the frame.

The lower base plate is seated firmly on its cast, and the upper portion of the frame moved until the attached cast finds the correct position in its base plate. Moderate pressure should be applied centrally to the two casts to insure the firm seating of each in its base plate. Pressure on the anterior portion will give too steep, and on the back too slight, an inclination to the paths.

The frame should be held in one hand, the thumb on one side and middle finger on the other, producing the pressure on the central portion of the casts. With the thumb and index finger of the free hand, the end of each condyle path should be moved up and down until they assume a neutral position of test, the sides of the slots not impinging on either side of the pin. Test and set one condyle path before setting the other. When the condyle paths are firmly clamped, the bite locks and gauges are removed and the spring again hooked in place, which brings the base plates back to their correct position.

Developing the Compensating Surface of the Wax Rims.

A line drawn on the wax rims parallel with the condyle path so as to intersect the plane of occlusion, forms the basis for establishing balancing contact. By this system, two

chords of an arc, or of parallel arcs, are given as bases for finding a third chord, which represents the correct inclination of the wax in the location of the second molars.

The plane of occlusion represents the first chord, the line drawn parallel with the condyle path the second chord, and the third is developed by bisecting the angle formed by the junction of the two existing chords and erecting a perpendicular to it at the correct line of division between the base plates. A more convenient method of finding the third chord consists in measuring an equal distance from the angle of intersection on each chord and connecting the two points thus established.

The third chord should be placed at the correct line of division of the base plates. If it does not fall in this location according to the method given, a line drawn parallel with it can be laid at the correct point. When the third chord is established properly, its anterior end should be extended forward in the form of a curve, which should terminate at a point anterior to the cuspid tooth. By adding the wax sliced from the upper onto the lower base plate and vice versa, the planes are quickly corrected, and can usually be worked out very accurately.

Since the labial and buccal surfaces of the wax rims indicate the correct position of these surfaces of the teeth, care should be taken to disturb as little wax as possible except that necessary for the setting of each tooth. This applies more particularly to the upper than the lower wax rims.

The teeth of the full upper denture are arranged first, beginning with the central incisors and passing backward in regular order, setting the tips of the cusps of the bicuspid and molars firmly against the lower wax rim. As each tooth is placed, it should be firmly affixed with a hot spatula.

The lower second bicuspid is set in position first, securing proper contact of the mesial and distal planes with the opposing teeth. The frame should be moved laterally to test the relative position of the planes when the teeth are in working condition; in other words, moved to the differential limit on the working side. If contact is broken, correction should be made immediately, to obviate further trouble.

Each tooth, as it is placed, is tested in the same manner, and corrected when necessary, until close contact is effected between the mesial and distal planes of the bicuspid and molars on both buccal and lingual sides. The first and second molars are adjusted, then the first bicuspid on both sides. The six anterior teeth are usually placed last, proceeding forward from the cuspids to the central incisors.

When the teeth are all firmly fixed in wax, insert a strip of carbon paper between the occlusal surfaces and subject the casts to lateral movement. The high points are thus disclosed and correction made with a small engine stone. In some cases this step is followed by using a paste of soap and 100 grit carborundum powder, covering the entire occlusal and incisal areas with it. The teeth are then held in contact by pressing on the two casts and subjecting the frame to lateral movements for perhaps five minutes. The paste should be returned to the occlusal surfaces from time to time as it works out.

The same general method of using carbon paper and re-grinding is resorted to in fitting the finished dentures in the mouth. By this means any discrepancies in the radial swing of the dentures, due to variation of the rotation centers of the frame from those of the mandible, is corrected.

Testing Wax Model Dentures in the Mouth.

Usually it is best to test the model dentures in the mouth before vulcanizing. In most cases no change will be required, but if so, it can be easily and quickly effected.

Waxing and Flasking Cases.

These steps are carried out in the usual manner, care being taken to expose the entire peripheral margin of the denture as the plaster is applied to it in the first section of the flask. This insures the easy packing of the matrix, since all of the rubber can be placed together in bulk, and allow the further test of a full, but not excessively packed, matrix, to be made later on.

Separating the Flask.

The flask should never be placed in hot water to sep-

arate, but should be heated in an oven or over a Bunsen stove to a temperature not exceeding 140 degrees F., which is sufficient to soften the wax.

Removal of the Wax.

When the flask is separated the base plate is removed, and the bulk of softened wax taken out with instruments in the usual manner. The matrix side of the flask is set on an incline, and boiling water allowed to fall from a considerable height into the matrix, the idea being to remove the wax in as short a time and with as little water as possible, to prevent the plaster from becoming saturated. The second section of the flask containing the cast usually requires no treatment.

Packing the Matrix.

The section of flask containing the teeth is set over a flame of moderate size, and heated through, but not so as to disintegrate the plaster. The rubber is packed in the usual manner, being careful to have less rather than an excess. A piece of moistened muslin is laid over the rubber, and the flask placed together and partially closed with the screws. It should then be heated to a temperature not above 200 degrees F., dry heat, brought together with the screws, and again opened. The muslin is easily removed by moistening with a pellet of cotton. An examination of the case will disclose any deficiencies, and sufficient rubber can be added to insure a full, but not overpacked, matrix. The flask can now be closed without any undue stress being exerted on the cast or matrix.

Vulcanization.

All cases should be vulcanized in steam and not under water, as saturated plaster readily distorts under high temperature, and slight, continued pressure. Any flask in which there is a small excess of rubber present, is subjected to pressure until the rubber hardens, so care should be taken to preserve the integrity of the plaster as fully as possible.

Physical Properties of Plaster.

Recent research work by eminent men in the field of building material, notably Dr. Glaesenap, of the Technical Institute of Riga, Russia, has disclosed some peculiar features

in reference to plaster. I take the liberty of quoting from a former paper of mine on this subject, based on Glaesenap's findings:

"If some freshly mixed plaster is placed on a slide and thinned out with the cover glass until translucent and examined under the microscope, tufts of long, thin, needle-shaped crystals will be seen to form. They will be piled in irregular groups, and as the setting process continues other crystals will be attracted to, and form upon, the masses already congregated. They are grouped without order, lying very much like a bunch of straw with many irregular spaces between.

"Some of these spaces become partially filled by the more slowly setting particles which crystallize later on.

"A plaster cast which appears hard and resistant is composed of innumerable delicate crystals, so grouped as to leave an intricate network of open spaces permeating the whole mass. Crystals of the character described will withstand stress up to a certain point, but will be instantly shattered when the modulus of resistance is reached. If our eyes possessed microscopic power, or the crystals of plaster were of macroscopic size, we could see a most terrific convulsion occurring during the closing of an overpacked flask. Crystals shattering and flying in all directions, others bearing their load up to the modulus limit, and merely breaking, and others again, maintaining their form and position without change.

"Each broken crystal paves the way for a misfit denture, and although the destructive effect of heavy pressure on the face of the model may not be disclosed to the eye in the finished denture, it will be apparent in its impaired adaptation."

Force Ordinarily Applied in Closing Flasks.

As a matter of fact many casts as well as matrices are distorted in the closure of flasks because of the enormous pressure exerted. Few realize how much force is ordinarily generated by a screw of the flask bolt type and the regular four-inch flask wrench.

The force exerted by a screw is determined by the following formula:

Power : Weight :: Distance between two contiguous threads :
 $3.1416 \times \text{twice the length of the lever.}$

Example — 50 lbs. on wrench handle —

$50 : \times :: 1/20 : 3.1416 \times 2 \times 4.$

Solution —

$50 \times 25 = 1250.$

1250 divided by $1/2 = 25000.$

Deducting $\frac{3}{4}$ for friction — 8333 +

When heated properly a flask can be closed with from 3 to 5 pound power exerted on the end of the wrench handle. Even with this slight amount of power a force of more than 500 pounds is exerted on the face of the model.

Progress of Anatomical Methods.

What can I say in addition to what has already been said to induce those who are not already engaged in this work to take it up? The strongest argument possible is the verdict of the patient. Those cases which have proven failures with the best efforts under ordinary procedures are invariably benefitted, and in nearly every instance the most desirable results are attained.

Looking at it from the financial side, very much better fees can be secured than is possible under the old time methods of procedure.

The anatomic method is scientific, logical and right; the older methods are wrong and should be discarded. Our profession is progressing in other lines, and it should keep pace in the prosthetic field.

By way of encouragement, it may be interesting to know that nearly 10 per cent. of the practising dentists of this country are constructing dentures by anatomic methods. More than 600 graduates of the Northwestern University Dental School have entered practice, prepared by training and equipped with suitable appliances to pursue this work intelligently.

A number of State Boards of Dental Examiners, the Illinois Board included, demand from each applicant for license a practical working knowledge of anatomic methods.

Finally, the satisfaction that accrues to the prosthetist from his ability to render such eminent service, repays him for the effort involved in acquiring the necessary technic and in carrying out this work in accordance with nature's plan

KNOWLEDGE AND BELIEF

BY H. P. PICKERILL, M.D., UNIVERSITY OF OTAGO, NEW ZEALAND.

In recent papers in this JOURNAL bearing on the subject of the prevention of caries, the question of "priority" has been mentioned. I regret very much that this should have been so, and I have no intention of entering into a discussion on the question. The work we are engaged in is far too important in its bearings upon the public health of civilized communities to be belittled by having any discussions of a personal nature ranging round it. The work with its results is everything; the man who happens to do it, merely the accidental instrument. It behooves every one interested in this national and world-wide problem to keep abreast of what is being done to help forward the work by criticism and suggestion rather than to advance individual claims as to priority of publication.

As regards the advocacy of natural organic acids, I should like to point out what really must be well known to every one—namely, that these substances have been known to act as sialogogues or salivary stimulants from time immemorial, the oldest of text-books on *Materia Medica* will mention the fact.

The work of Haidenhain and Langley, too, long ago showed that the secretion of the salivary glands varied with varying electrical stimuli of the chorda tympani nerve.

What we did not know, however, was the precise relationship between ordinary articles of diet and salivary secretion. On this matter our knowledge was a blank; in fact, Langley himself admitted that our knowledge of salivary secretion in the human being was so small as to be almost valueless. Practically all work had been done on the dog or ox, little or none on the human subject, and no one would suggest that the composition of ox or dog saliva was of *necessity* governed by the same laws and subject to the same variations as human saliva.

Again, I would like to point out that no reliable inferences can be drawn from analyses of saliva obtained from various sources at various times, or subject to no definite or known stimulus. Further, I think the time has arrived when the dental profession should distinguish between conclusions drawn from experimental and scientific data and conclusions based merely upon the "opinions" of a writer.

The latter are frequently stated dogmatically and with some show of authority, but when examined critically as they should be by every intelligent reader, it is too often found that the statements or "theories" rest upon no real work at all, but solely upon the ideas, thoughts, or wishes of the author. The latter may have been lucky and hit upon a winning thought, but, to phrase from another "field," to have "selected the winner" is not of necessity to have even taken part in the race.

I write more or less subjectively. Eleven years ago I read a paper at the University of Birmingham (published the year following) on "The Effect of Civilization on the Teeth." This was written almost wholly upon abstract data from what I thought was correct, and based upon what I hoped to be right. Among other things I then stated:

"One of the chief differences between civilized and uncivilized man is the difference in his food. There would seem to be in man an instinct, one of the most primitive and ineradicable with which he is endowed, to eliminate from his food all that is inert and innutritious, and to retain only that portion of it which is nutritious. For instance, each individual prehistoric man had to seek his own food, and, if sufficiently refined, to cook it; and it consisted mostly of meat, fish, roots, and nuts. Since then the 'nutritive' instinct of man has been working gradually but effectually until it has persuaded him to set up flour mills, rice mills, sugar refineries, meat-juice factories, etc., and to establish elaborate systems for the preparation of his food in bakehouses, biscuit factories, and kitchens. Yet the essential elements of our food have not altered; we, just as much as the Ancient Britons, require proteids, carbohydrates, fats, salts, and water.

The change that has taken place, however, is a gradual elimination of all the coarse, fibrous, and inert matters from the food which are present, to a large extent, in the food of savages: with the result that the teeth are no longer used and burnished by these natural tooth brushes and powders, and stomach and intestines no longer receive the necessary stimulus for their proper action.

"As a second result of lessened mastication, there occurs a lessened secretion of the salivary glands. This is detrimental to a very serious degree in diminishing the supply of the mouth-wash intended by Nature to cleanse the teeth.

"The effect of fibrous substances in the food is to stimulate Lieberkuhn's follicles, and to promote peristalsis, and, as has been shown, its absence brings about constipation and intestinal disorders. The effect of this is an unhealthy state of the mouth, furred tongue, and an accumulation of foul secretions upon the teeth.

"The diet of the French nation, as a whole, is a highly civilized one, and caries is very prevalent. The diet of the Bretons—their close neighbors—consists mainly of fish and dairy produce, and they, as may be expected from our argument, possess very good teeth. Caries, too, I believe, is very rare among the Scotch Highlanders, whose diet consists chiefly of oatmeal, fish, and game—"poaching" being one of their staple industries.

"Few children are now brought up on the food which Nature intended they should have: one or other of the many artificial foods introduced by a high state of civilization is almost invariably substituted."

The greater part of the above statements were *belief* and not *knowledge*, and on thinking the matter over after publication I realized that it was so; that it was a structure without foundations, theory without facts, conclusions drawn from an unproved premise. I realized that a very considerable amount of work would have to be done before one could write or speak with any correctness or authority as to the physiological means of natural immunity to caries. It was several years before I could actually commence the work, but having done

so, I was constantly realizing the sharp difference between *beliefs* and *knowledge*, and congratulating myself on having kept silence, even while others were busy publishing—chiefly their beliefs.

Take another branch of our subject mentioned in the above quotations. Much has been written at various times by various authors (myself among them, I regret, to a small extent) on the physiology of mastication. On examination, what does it all rest upon? Supposition, beliefs, a priori arguments from unproved data. We have been preaching a gospel of unproved worth.

I have recently been investigating the subject from exact anatomical and physiological points of view (and have made a communication on the subject to the New Zealand Dental Association). The results so far are certainly rather astonishing, since they do not bear out what has been previously written, and if the present work is confirmed, it will be necessary to considerably modify those teachings with which the names of Fletcher and Sim Wallace have become so associated. It is merely another example of the absolute necessity of "proving all things," of taking nothing for granted. The present is the boasted age of scientific advancement, training, and methods; we must accept it, must live, think, and act accordingly. Empiricism must give place to scientific rationalism; traditions, beliefs, plausibilities, must give way to knowledge.

REPORT OF THE DISPENSARY COMMITTEE, MASSACHUSETTS DENTAL SOCIETY, 1912-1913¹

Two years ago your committee made a State wide canvass for the purpose of finding out how far the dental dispensary idea had become embodied in fact. Thirteen dispensaries altogether were reported. Last year a similar canvass was made, and a number of dispensaries added to the list, the majority being school dispensaries. This year your committee decided it was wiser to discontinue the wider investigation and bring before the society a study of the school dispensary alone, founded on a history of the school dispensaries which were reported up to a year ago, supplemented by statements from each one of these giving present conditions and tendencies. This decision of the committee was made with the knowledge that the interest of the public in dental hygiene as related to schools is general and is increasing, and that no other form of dental clinic is likely to be so widely introduced as the school clinic. Moreover, this whole question has become doubly interesting and important by reason of recent State legislation and through evolutionary changes which are becoming apparent in the dispensary. By forces acting both from without and from within, the school dispensary is likely to progress with considerable rapidity during the next few years.

To make this situation as clear as possible, it is proposed to give an account, brief in most cases, of nine school dispensaries reported last year and the year before, and then to supplement this with such comments and suggestions as may seem pertinent and helpful.

It is true that dental hygiene in schools has had but a brief existence, the oldest dispensary dating from the spring of 1910, but in pioneer enterprises of this nature considerable experience may be gained in three years, and certainly this is true in the present instance.

¹ Read before the forty-ninth annual meeting of the Massachusetts Dental Society, May 8-10, Boston, Mass.

The list of dispensary towns and cities where school boards and school interests exercise control of the dispensaries includes Somerville, Winchester, Revere, New Bedford, Chelsea, Provincetown, Sharon, Cambridge and Lowell. One of the dispensaries has been discontinued, temporarily at least, that in the town of Sharon. The work was reported by the School Superintendent as very successful up to the time of its discontinuance. This experiment should not be classed as wholly a failure. A demonstration was given, which was highly appreciated, and it will not be forgotten.

The agitation for a dispensary in Lowell was begun considerably more than a year ago, and an equipment was bought with a city appropriation of \$900; there the movement rested. A quotation from a recent report sums up the present situation: "Twelve men in the (Lowell dental) society have agreed to give their services, beginning May 1, until the close of the year. We hope in that time to demonstrate the necessity of such work, and perhaps prepare the way for hiring a man to attend to it permanently. The School Committee will supply a woman assistant."

The dental clinic in Chelsea is but a month old, and can furnish but little illumination. It is in charge of the Board of Health, which carries it on as a part of the health supervision of the schools. The clinic was established through the combined efforts of the School Superintendent and the dentists, with the approval and authorization of the School Board.

A clinic was opened in Cambridge last year with voluntary workers and a voluntary attendant. Work was discontinued, for a time, last autumn, with the hope that the city would furnish a paid attendant. This was not brought about, and the volunteer service has now been resumed.

A report from Provincetown indicates that the free clinic on Saturday, combined with work at half-price in the dental offices, has proved only partially successful.

The older dispensaries in Somerville, Winchester, and Revere, all dating from the spring of 1910, and in New Bedford, dating from March, 1911, exhibit a vitality that is reassuring. New Bedford has the largest enrollment of workers,

twenty-nine, and can probably show the largest record of work. For the past two years the totals are as follows: Teeth filled, 1,245; cleansings, 249; teeth extracted, 926; treatments, 278; patients, 816. The children are all from the primary grades, and have been selected from twenty-three different schools.

The Revere dispensary was started through the combined efforts of a dentist and a physician, and for three years dentist and physician have worked together in Revere in the cause of dental hygiene. The history of this clinic has been marked by steady perseverance and satisfactory results, and is unusually interesting in all its details.

The dispensaries of Somerville and Winchester have been reserved for more extended review, for the reason that they present strongly marked characteristics. The work in Winchester is carried on in dentists' offices; it is carefully planned and highly efficient. Paragraphs from a recent estimate of this work by the Superintendent of Schools will indicate present conditions:

"This work has been going on successfully for three years, and is now a matter of routine. We do not think that we have done all that we ought to do in caring for the teeth of school children, but we feel sure that the method which we have followed has no weak points, and is as entirely successful as any clinic could be. I should not wish to be understood as suggesting that our arrangement, whereby pupils go to the dentist's office would necessarily be the best for all places, but I am perfectly certain that it is the best for us and for most small towns. It is likely to be far more effective in training children to go to the dentist than any other arrangement that has been devised to date.

"The next step which we propose to take is to inaugurate a follow-up scheme, whereby we hope to secure a greater degree of attention to dental notices on the part of parents who are not so poor that defects in their children's teeth can be remedied as a matter of charity, nor so well-to-do that they can send children to the dentist without anxiety about the expense. With this class the cost of dental work is a very

serious financial burden, and it is, therefore, the more difficult to persuade them to take action."

An examination in the Washington School, Winchester, in March, 1913, taken with another, which had been made in October, 1912, indicated that the gain for that group of children in teeth needing no attention, was approximately 9 per cent.

The work in Somerville is about as different from that in Winchester as could well be imagined. It is carried on in a room of one of the grammar school buildings, and is small in comparison with the extent of the need. Till recently there have been no regular dental examinations in the schools, and there is no school nurse. Within a few months, on account of the falling off from twenty-five to twelve in the number of volunteer dentists, the unpaid force has been replaced by a hired dentist and a hired woman assistant. To cover these and other expenses, an appropriation of \$1,000 was voted by the School Board. The dispensary is open every morning except Tuesday and Saturday from nine to twelve. On Tuesday the regular work gives place to examinations in different schools. An unpaid service is still furnished by a group of dentists in their offices, the details of which are placed upon cards provided for the purpose, which, upon the completion of the work, are sent to the dispensary for inclusion in the dispensary records. No charges or collections are made in the offices. Changes so recent and so radical as these in Somerville must be given time to adjust themselves. Present indications are favorable. Much depends on the equipment, experience and personal qualities of the dental worker and his assistant; but it hardly seems possible that an institution which is succeeding elsewhere with a paid service will fail of success here. To those persons in authority in Somerville who had come to have full sympathy with the dispensary idea, and who gave their time and efforts to securing an appropriation to forward the work, too much praise can hardly be given.

Reviewing the history of the several dispensaries, it is evident that in the pathway to such success as has been at-

tained, serious obstacles have been met, hindering advance in several instances and rendering even a routine continuance difficult. Among the more prominent of these obstacles are the partial failure of the volunteer service, the lack of adequate attendance including the school nurse, uncertainty regarding the right of cities and towns to make appropriations for dispensary purposes, the failure of those in authority to appreciate the value of the new enterprise, and the numerous perplexities of detail which always beset the organization of new movements.

Your committee believes that, with one exception, all these obstacles are gradually being removed. The passing of the bill giving to the city of Brockton the right to appropriate a sum not exceeding \$5,000 for dispensary purposes puts a new face on the whole question of appropriations. It does not settle the question of public dispensary support, but it probably means that each town and city will be given the opportunity to settle the matter for itself.

The paid service at the dispensary really means that the public has come to feel that society is responsible for the evil which the dispensary seeks to reduce, and that some of the expense for reducing it should be paid from public funds. Your committee feels strongly that the day of unpaid dental service, as the only service, is passing. Under certain conditions it may not pass for a long time to come. It will often be necessary in the starting of dispensaries and as a demonstration it will still have a place. It means self-sacrifice, and without self-sacrifice advance is not possible. During the past few years the dental profession has given evidence as never before of its possession of this high quality. It has proved that it has both the desire and the ability to enter fully into the great social advance of our time.

For the rendering of possible assistance in the planning and management of the school clinic, your committee would offer the following suggestions:

(1) In a dispensary where the service is unpaid, it would appear necessary that full authority for carrying on the work be located in one person, to whom should be reported any

inability to keep an appointment for the day or in the future. This person should be able to command emergency workers that the service of the dispensary suffer no break. Any looser method would be likely to result in partial failure.

(2) It would be altogether better that a paid worker in a dispensary should have had some definite instruction or special training in the management of dispensaries, or at least some experience. It is not unlikely that provision to this end will be made in the near future.

(3) Whether the paid worker is experienced in dispensary details or lacks experience, it would seem desirable that a dental committee, representing the local dental society or the local dentists, should be included in the management of the dispensary, or, if not that, should be available for consultation.

(4) Anything like careless or ill-advised methods, lack of regularity and order, or failure in punctuality, would be specially harmful in a public clinic.

(5) It would seem best to make a selection of children for treatment from primary grades, in age not above nine or ten.

(6) A follow-up plan should continue the help which has been given, to insure the most satisfactory results.

(7) It would seem altogether desirable that examinations be kept up in the schools, and especially in the same school or with particular groups of children, for the purpose of securing accurate statistics, making apparent the percentages of gain.

(8) Education in the care of the teeth and mouth and demonstration of the use of the toothbrush and floss silk should be an important part of the help given by the dispensary workers.

(9) The need of a woman assistant in the dispensary and a school nurse for home visits, care of the children and other details, can hardly be overestimated.

The school dispensary is a move in the right direction. First of all, it gives expression to some of the finer feelings, some of the higher ideals of the profession; moreover, it is in

accord with the educational trend of the times. This trend recognizes that education is not merely the acquisition of certain facts, but rather the fitting of the child for life. In this newer education, vocational training has a large place. But vocational training recognizes the body and the need of a healthy body, for a healthy body more readily takes on training and becomes a more perfect instrument of the spirit. It is the mission of the dispensary to assist in building up a healthy body. It seeks to do this largely by prevention and the removal of obstacles. There should be no surprise that many of the foremost friends of education extend to it a welcome.

For the committee,

HENRY H. PIPER, *Chairman.*

REPORTS OF SOCIETY MEETINGS

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK

January 6, 1913.

A regular meeting of the First District Dental Society of the State of New York was held on Monday evening, January 6, 1913, at the Academy of Medicine, 17 West Forty-third Street, New York City.

The president, Dr. Herbert L. Wheeler, occupied the chair, and called the meeting to order.

The paper of the evening was read by Dr. J. H. Prothero, of Chicago.¹

Discussion of Dr. Prothero's Paper.

President Wheeler—We have with us two gentlemen who are connected with dental schools, and who are authorities on this subject, from whom we expect to hear to-night. The first one who will speak is our friend, Dr. Leuman M. Waugh, of the University of Buffalo.

Dr. Waugh—It is my purpose to show the first Gritman models made to be used in taking the condyle path. Perhaps Dr. Prothero will take issue with me, but I believe I can say it was my privilege to be the first demonstrator to have had a class of students apply the anatomical articulator and the face bow to this work. Previous to that, a few students had used the face bow, and this method of proving out things they had dreamed of; but Dr. Gritman and Dr. Snow—especially Dr. Snow—met many disappointments in this work. They were told it was of no practical value, and it took some persuasion to convince us; but when the method gathered to it a few stronger advocates, like Dr. Prothero, it gained by the courage of their convictions.

This has been before us fifteen years, and out of the fifty-four or fifty-five dental colleges, I wonder how many are teaching it? I wonder how many professors have really

¹ See page 210.

studied Gysi's classic? I wonder how many of us to-night have studied it? We have glanced through it, I know; but how many have really studied it? How many comprehend that Dr. Gysi has tried to prove those few practical facts by a mass of data, and has made us feel that it is too complicated for us? If he had given us the proof, and the plain, everyday part of it, a good many more of us would have considered it more practical in our work.

The subject has been comprehensively covered to-night. It is as concise a statement of the facts as a man may give in one paper. My inclination would be to say that he has told you just what there is to it, and then to sit down; but he has said that he shortened his paper to give those who are down on the programme a chance to discuss it, so I will just say a few things, and give him a chance to give us a few more points.

He said that the condyle path in no two individuals is identical, and it is rarely identical in the two sides of the mouth. I will show you a few slides I have brought with me.

(Dr. Waugh's slides outlined the anatomy of the condyle, the glenoid fossa and surrounding parts.)

. . . Here are two condyles, showing an extreme difference. When we feel it is positively necessary for us to be accurate in measuring everything pertaining to the anatomy of this joint, to get practical results, we are mistaken. We must get a certain approximation, but it is impossible for us to get it absolutely perfect. This is not something we can work out on mathematical principles, as we apply it in everyday practice. It is relatively accurate, and the appliances in use must be only relatively accurate.

This question of anatomic occlusion has been before the profession for over thirty years. Dr. Evans, of Philadelphia, evolved an articulator with an occluding joint. Then came Dr. Bonwill, in 1858. Then Hays, and then Walker, in 1896, giving us conclusive results of his measurements for the condyle path. Here is something which has really developed within the last ten or fifteen years. In 1897, the Snow face bow was given to us, and that is the *sine qua non* of success.

No matter how perfect, without a means of measuring and transferring that to the model, we cannot hope to have success; and Dr. Snow has not, in my opinion, received credit for what he has done. The face bow was developed from his own thought. Its value was stolidly repudiated by Bonwill up to the day of his death. We know to-day that we cannot get success without having that as a foundation. I think right here in his own State, we have overlooked the fact that he has given us *the* essential thing for practical success in this work. (Applause.)

I am going to talk but little to-night, and I hope you will not criticise me adversely, because I am going to uphold something that has developed practically under my own eye. I refer to the only practical apparatus that has ever been given for our everyday work.

Dr. Gysi's work is a classic, and the Gysi articulator is the result of a master mind. The manufacturer has not given us anything to date which permits of practical expression of what that master mind conceived. The Gysi articulator cost us \$35. They said it was made by jewelers, because it was so delicate. It was made of soft brass, so that it had too much spring, and then it had such loose joints that the movements were not accurate enough to bring about the full expression of what Dr. Gysi gave us; and when I say the New Century articulator and the face bow are the only practical ones for us to-day, I am not saying anything against Dr. Gysi's idea.

The idea that is not given in the other articulators is that we may have the points of rotation brought out. In the Gysi articulator, we may move it from here to here. That was all worked out by Dr. Snow, and he even said the space from here to there made so little difference that it would be better to have one to four inches, than one to two, because the average man would get better results with it.

One face has thick walls, and another has thin walls. We saw the asymmetry in those. I hope we will have moving pictures some day of these things, so we may see all those points.

The movement of the teeth, one upon the other, is often

something we do not understand. We know the condyle on one point is immovable sometimes, and the other moves forward and downward.

Moving this condyle forward in its path, the teeth on this side describe that curve upon themselves. They come almost directly forward, going slightly to the lingual. What is their path of travel on this side? This is the direction. The difference between those two points is very little. The articulator that has a four-inch gauge does not miss very much. It is proved in practice.

We speak of the articulators not having a curve in their condyle paths. They do not need to have a curve. The head of the condyle does not travel very far. It comes down on the eminencia articularis, and there is enough to compensate for any slight curvature.

We have here something that compensates for it. I doubt whether we can measure it, even with the Gysi device. So the objections to the Gritman and the New Century, and the others which do not try to represent the curves, are not of great value.

Dr. Snow studied that all out, and Dr. Prothero will tell you he gets practical results, and a little later I will tell you of something else that will help you. The jaw does its own curving. It will not militate against your success.

Dr. Prothero has spoken of the amount of overlap. The distance the upper incisors pass over the lower, is controlled by more things than Bonwill told us. The descent of the condyle path is of importance, too, and the depth of these cusps. This is also from Turner's book. I am beginning to realize these things. Formerly I took the temporo-mandibular occlusion as a fixed point, but I am looking at it in a different light now. I do not know what the orthodontists will say to me to-night; perhaps they will chop me into little pieces, but I will tell you what I think about it.

By beveling these teeth in this direction, we can get a good deal more overbite, and by slightly increasing the distance between the labial surface of the lower, and the lingual surface of the upper, we can get more distance of overbite—I

call this overlap—and by increasing the distance here, we can increase that.

It is argued that the Gysi Articulator is a very important thing. What is its purpose? Simply to have an arrangement of the teeth, so that these incisors, for instance, will not catch one upon the other, and tip the plate out. Every student in college has to do that, and he has to correct it, so the incisor guide to me is nothing more than a nice piece of apparatus for instruction. I should not use it in everyday practise. I do not need it. Why do you need a guide if the teeth will do it themselves?

Here is a slide I like to refer to a good deal. It is a picture of teeth that have been worn out in the ordinary process of attrition. See the slight compensating curve here, and the raised part here. See how they are worn down. The occlusal surfaces are just as flat as can be. The only enamel is in the depth of the curves, and in the sulci; all the rest is dentin.

Dr. Prothero spoke of taking the bite, but the point he did not emphasize was, that we want a good deal more compression in the rim. If we do not have a good deal there, in the molar region, so these cartilages are compressed when the bite is taken, when we put the finished plates in this will press, and there will be spaces between the molar teeth, and we do not get the fullest efficiency. That is a very important point to me, which is very often overlooked, and I think it is just as important as the point Dr. Prothero emphasizes by putting the thumb in the cast of the lower, and the middle finger in the upper, so as to get free motion. Compress the cartilages in the molar region by having the wax fairly full when you take the bite.

This slide is from Dr. Prothero's article published some time ago. Here we have the curve of Spee, and here a lateral compensating line, which, I think, if we were going to name it for anybody, we should call the curve of Prothero. The lingual cusps of the lower teeth must be on a lower plane than the buccal cusps, and this lateral curve in order to have the greatest harmony, must correspond with this curve.

(Dr. Waugh read notes.)

I appreciate what the dental manufacturers have done for dentists, and their sincere effort to give us many things we want. I appreciate the fact that they spend a great deal of money in carrying out ideas that never amount to very much. I spoke to Mr. Gilbert, of the S. S. White Manufacturing Company about different forms of artificial teeth. His answer was, "You will first have to create a demand among the profession, and when you do that we will manufacture them." I appreciate the efforts of one manufacturing company to give us better forms of teeth; and when I read this sentence to you, it is not adverse to any one in particular, but tending toward the scientific application of principles we have in dentistry.

(Dr. Waugh read same.)

The Simplex Articulator, in my mind, is not one bit better than the Gritman. I would rather have the Gritman, and the Gritman is not nearly as capable of giving good results as the Twentieth Century. The manufacturer in giving us the Simplex, is either deceiving himself, or he is trying to drag down a master mind for commercial purposes, and I cannot quite conceive of that.

Dr. Prothero always says "the Gritman-Snow" or "the Christensen-Snow," or "the Somebody-Else-Snow." I appreciate what has been done by all these people. Dr. Snow has given us a method for applying it in practice. I would not say "Christensen-Snow." I would rather say "Snow-Christensen." You cannot get away from it. Snow has given us the only means of applying these principles.

Dr. Prothero says when teeth are set up on a plane line articulator, the patient can only have a hinge-like motion. I think that is fairly true; but in a year or two the teeth will change the minute anatomy of the parts. Didn't we use to say to our patients, "In a year or two you will be perfectly comfortable with them, and you can keep the plate in all the time." Why did it take a year or two? I think it is largely because the occlusion of those plates gradually brought about

a change in the minute anatomy of the temporo-mandibular articulation.

One thing essential to success is a rigid base-plate. The best thing I have found is sheet lead, rolled to about 29 gauge. With a lead pencil you can adapt that to the cast, slitting it and taking a second piece, and you can get an ideal base-plate in a few minutes. The ordinary plate in my hand was too brittle. The lead does not break. We do not have to take out wax from the cast. We can put the lead right in the flask. You know what a nice surface metal gives in the vulcanizer. There is a minimum amount of polishing necessary afterwards. I think this is the simplest, quickest, and most satisfactory base-plate a man can use.

Dr. Prothero has shown us impressively the amount of pressure that is brought to bear. Dr. Wilson, of Cleveland, recommended to me, and in his book he speaks of the use of Spence plaster. Dr. Prothero did not speak of it—perhaps he did not have time to mention all the points he wished. Spence compound, in my hands, has given great satisfaction.

We can correct in the mouth itself any little inaccuracies that may creep in, and that can be done in this way; and I urge you to use it, whether you use the anatomical articulator or not.

It has been my practice to take carborundum powder about 100 grit, and mix it with any vehicle—first I used vaseline, but that was too soft, and now I use the same material that is used for soap—white wax and paraffin and vaseline or cocoa butter. Mix in the carborundum powder, and put in a little oil of cinnamon. I explain to my patients that it is not as pleasant as it might be, but that we get better results.

We should do that every year or two with our artificial dentures, following the idea of the miller sharpening his mill-stones to get better attrition, and I think we can do it better in this way than any other. I think if we use that it will prove of greater advantage than you would ordinarily believe.

Dr. Ellison Hillyer—When one heartily agrees with an essayist, it is extremely difficult to discuss what he has written, except to indorse the views expressed. In a previous read-

ing of Dr. Prothero's paper I realized that he had not gone into the consideration of the work of Professor Gysi to any extent, other than to refer to the articles issued in the "*Cosmos*" in 1910; I have, therefore, selected some illustrations of Professor Gysi's articulator, showing its construction, application and the principles upon which it operates; also, some illustrations of the later Gysi articulator—the Simplex—which has been referred to by both Dr. Prothero and Dr. Waugh in the most severely critical manner.

(Here followed the illustrations referred to as well as a demonstration of the newest improved Gysi articulator which has not as yet been placed in the hands of the profession. This last differs from its predecessor, in that the records of the movement of the condyle are indicated by movable planes which are attached to the frame and are not detachable as formerly. Also, a record of the horizontal planes which are transferred by an occipital bow to which plates of ground glass are attached, and upon the under surface of which tracings are made by the action of the mandible, in opening and closing the jaws with the face bow in position.)

Dr. George W. Clapp—A few points have been brought out which are worthy of more extended attention than can be given them at this late hour. First of all, I want to acknowledge by indebtedness to Dr. Prothero for my first practical information in anatomical articulation. I shall always be grateful for it.

And now, having acknowledged my indebtedness to him and my admiration, I want to pitch into some things he has said and endeavor to show that the Simplex Articulator, which he "damned" not only with faint praise, but in precise terms, is not only not so bad as he painted it, but that it has certain claims to be the best of what may be called the simple articulators.

To do this, I want to give you a brief explanation of the lateral movements of the condyles in lateral movements of the jaw. Dr. Waugh hinted that the movements of the condyles may be determined by the teeth. He is undoubtedly right. The condyles probably come first, and their movements aid

in guiding the erupting teeth to proper places in the arches. But the teeth, once erupted and firm in position, determine the movements of the condyles, during such movements of the jaw as are made with the upper and lower teeth in contact.

We know now what we did not know until Bennett, of London, showed us, that these condyles are not guided straight forward and back, but that they are guided inward toward the median line as they come forward. The average inclination in some hundreds of cases recorded by Dr. Gysi is 16 degrees. This lateral movement of the condyles is essential to the proper articulation of the cusps of one set of teeth, with the grooves of the opposing set.

Now, this lateral movement of the condyles cannot be considered all by itself, but must be taken in connection with another discovery, for which I think Bennett must also be given the credit. It is that the mandible swings on "hinges" or rotation points, which are rarely, if ever, located in the condyles. There are many centers of rotation for different movements, but one of them is of more importance to us than any of the others. It is the center on which the jaw hinges during the first part of the articulating movement. And it is especially important to all prosthetists, because it is the center which is used in raising or lowering the bite in prosthetic cases. By that, I mean that if this center is correctly reproduced in an articulator, the dentist may raise or lower the bite at will, without deranging the articulation of the teeth. But if the articulator exhibits any other center than this, any raising or lowering of the bite will derange the articulation in a manner particularly hard to correct.

Dr. Waugh says that it makes only a little difference in the movements of the teeth whether or not you have the lateral movements of the condyles. It need make only a little difference in order to derange the entire articulation. If you have studied the forms of natural teeth you must be convinced that when nature has designed the teeth and caused them to erupt in proper positions and polished down any points that interfere with articulation, the resulting mechanism is quite as fine and wonderful as that of any watch. And if we are to

furnish our patients with efficient substitutes for this fine mechanism, we must construct dentures quite as fine in their ways. And they must articulate closely, not nearly articulate, or almost articulate, but actually articulate, so that they maintain their positions in the mouth and really masticate food.

And now, in point blank contradiction of the statements of our honored guest, I want to say that I think the Gysi Simplex Articulator superior to all other simple articulators, because it has a condyle path which, though fixed, is probably as accurate in inclination as any that are likely to be restored by the protruded bite; because it has properly located rotation points, and because the artificial mandible exhibits the lateral movements of which mention has been made.

Without taking your time to go into the science of these lateral movements, I want to state to you why they seem to me to be so important. And in so doing I shall give you one of Dr. Gysi's most daring theories, which he intends to publish next summer.

You all know how difficult it is to arrange upper and lower cuspids in dentures or bridges so that they both occlude and articulate. Few dentists of my acquaintance can accomplish it. But Dr. Gysi intends to teach the method of doing it, for the reason that the articulation of the cuspids is quite as important as that of any other teeth. The reason is this. Dr. Gysi is now satisfied that the cuspid region of the natural jaw is the portion used as a fulcrum by nature when exerting masticatory force. You can demonstrate this on yourself if your teeth are in proper positions.

When the jaw passes toward the left, the upper and lower bicuspid and molars on that side pass out of contact. And when the lower jaw is so far to the left that the upper and lower buccal cusps of the molars are in the same vertical plane, there is no real contact between the bicuspid and molars. The cusps are interdigitated to prevent escape of food, but that is all. If now you press the jaws together in this position, two remarkable things may be noticed. The first is that you can make no considerable pressure in the

molar region, or in the articulating joint of the condyle. All the pressure is in the cuspid region. And if you hold the jaws in firm contact and slide the lower back to the position of central occlusion, you will feel the area of pressure gradually extend from the cuspid region backward. It will reach the molar region only when the jaw is in central occlusion.

The articulation of the cuspid region is so important, because this is the region of leverage during the most powerful movements of the jaw with the teeth in contact. I believe the Simplex Articulator to be the best of the simple articulators because I believe it facilitates the correct articulation of the teeth in this part of the dentures.

Dr. Prothero has shown us some interesting things, and I for one am grateful for what he has given us. But here in New York we do not think we have good balancing articulation of the dentures when only one molar is in balance. We like to see all the bicuspid and molars on the balancing side in contact. It makes a longer area, distributes the force more widely, locates the dentures more firmly, and, we think, increases their comfort and efficiency from the patient's viewpoint.

Dr. Prothero—Dr. Gysi must admit that one or the other articulator is incorrect, for the Simplex will not do the work of the adaptable appliance.

In producing the latter he has given us a very fine scientific instrument, capable of reproducing all of the essential jaw movements, regardless of the inclination of the condyle paths. In the Simplex the rotation centers are fixed and the condyle paths stationary. It is scientific only when the patient's condyle paths and rotation centers coincide with these fixed factors of the Simplex frame.

If you want a cheap frame, but one capable of a wide range of application, use the Snow appliance. You can set the condyle paths at 35 degrees for average cases, but when unusual cases present themselves, you can set the condyle paths to meet the conditions.

I am not interested financially in any of the appliances mentioned. My preferences are based on the results secured.

Patients can chew beefsteak and various kinds of fibrous food when properly constructed dentures are first introduced. They will pay from \$200 to \$300 for such cases when those produced by the old method yield a fee of \$50. Many patients come from points five hundred miles or more for work of this class. No one can tell me the system is wrong. It is *right*, and the results prove it.

I have not had what might be termed a failure in a single instance. Many cases require regrinding, some more, others less, to correct the radial swing of the lower against the upper teeth in later movements. Regrinding compensates for the variation between the rotation centers of the individual and those of the frame.

Dentures constructed by the Gysi, or any system, will be benefited to a greater or less degree by regrinding, and the smooth gliding, evenly balanced occlusion thus developed, is not possible by any other method. I will admit that the condyle paths change, not perceptibly, however, in a week or a month, possibly somewhat in a year. The change is gradual, and occurs only with the lapse of time.

Why not then construct dentures to conform to the anatomical conditions which prevail when the patient presents himself, rather than follow a stereotyped method with the hope that in years to come the patient's condyle paths will conform through the occlusal influence of the dentures, to those of the frame used in construction? I am sure better results can be secured by copying natural conditions closely.

In and around Chicago there are more than one hundred prosthetists who have been following the system outlined from two to five years, and they are getting equally satisfactory results. One practitioner brought his patient fifty miles to show me the excellent results he had secured. Scarcely a week passes that I do not get reports of successes in difficult cases.

Denture adaptation is the least of our troubles. We are getting results along this line that a few years ago were never dreamed of. If time permitted I could tell you of results that would surprise you. In some instances the adhesion of the

dentures is so close and the adaptation so perfect, that patients return to have the dentures removed. Such close adhesion, however, is objectionable because of its liability to set up inflammatory conditions, or cause absorption of the tissues.

Modeling compound is used in most cases for impression work. By repeated chilling, reheating the impressed surfaces slightly, and returning to the mouth, using considerable pressure, most excellent results are attained. This material is contra-indicated when undercuts are present, when the mucous and submucous tissues are thick and resilient, when any of the natural teeth are present, and when the ridge is soft and flabby and will be distorted under pressure.

My remarks are not intended to depreciate the work, or cast aspersions on the ability of the older men and methods. It is difficult to teach an old dog new tricks. In other words, it is not an easy task to persuade a man whose methods of practice are fixed, to discard many of the old and adopt new lines of procedure, as is required in the system outlined.

The younger, as well as older practitioners, however, who are ambitious and desire to progress, are blind if they cannot see the advantages to be derived from the modern methods.

I thank you for the consideration you have shown, the interest you have taken, and hope at some future time to meet you again.

Adjournment.

FREDERICK C. KEMPLE,
Editor, First District Dental Society.

BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION

The April meeting of the Boston and Tufts Dental Alumni Association was held at the College, 416 Huntington Avenue, Boston, on the evening of the 16th. This meeting was in the form of a reception to the senior class, and was greatly enjoyed by both hosts and guests. The address of welcome was made in a delightful manner by President W. H. Arnold, and following this Dr. Piper and Dr. Hopkins were called upon. This is the first of what promises to be an annual affair.

Four new members were voted upon and elected to membership. The announcement was made at this meeting of the appointment of Dr. Chas. F. Painter, of Marlboro Street, Boston, as the new dean of the medical and dental schools. Several committees were appointed. There was an early adjournment of the business meeting to allow time for the reception to senior class of Tufts Dental School.

The annual meeting of the Boston and Tufts Dental Alumni Association was held at The Villa Nopoli, Nantasket Beach, Wednesday, June 18, 1913.

The business meeting was called to order by President Walter H. Arnold, and reports of officers read and approved.

The report of the treasurer showed a gratifying balance on the right side. Business of routine nature was discussed.

The nominating committee of three members, appointed by the chair, and made up of Drs. Brigham, Krepple, and Adams, brought in the list of new officers suggested for 1913-1914:

President, Dr. Alfred G. Richburg.

First Vice-President, Dr. Newton A. Dewitt.

Second Vice-President, Dr. Eugene U. Ufford.

Treasurer, Dr. Geo. H. Paine.

Secretary, Dr. Anne S. Worthing.

Executive Board: Dr. W. H. Arnold, Chairman; Dr. J. F. Taylor, Dr. F. A. Sawyer, Dr. C. R. Given.

The secretary was instructed to cast one ballot for the foregoing list of officers, and this being done, said officers were declared duly elected.

Adjournment was made to the dining hall, after which the president introduced Melvin A. Johnson, M.A., Ph.D., Tufts, '92, president of Tufts General Alumni Association. The address by Mr. Johnson was fairly alive with wit and humor, but at the same time hard facts and sound advice was driven home with the touch of a master hand. The matter of appreciation of Tufts' worthy sons by her Alma Mater was, perhaps, especially timely and of tremendous interest and import.

Following this speaker, Dr. Chas. H. Painter, the newly-elected dean of Tufts Medical and Dental Schools, was introduced. To those who missed this opportunity to see and hear Dr. Painter we can only say that they missed a rare treat. The perfect sincerity and good fellowship shown by our new dean was in every respect commendable, and the consensus of opinion was that he was the right man in the right place. The intimation of Dr. Painter that the dental school would in the near future have its own dental dean, and that he had accepted his trust with that express stipulation provoked loud and continued applause.

The next speaker was the Hon. B. B. Johnson, of Waltham, who has the distinction of being its first mayor. His many intimate pictures of Abraham Lincoln, with whom he was closely associated for some time, were of special interest. He being present in order to hear his son's speech (the first speaker) was cleverly brought out.

The newly-elected president was introduced by Dr. Arnold, who made a few remarks.

The meeting closed with an impromptu reception.

ALFRED G. RICHBURG, D.M.D.,
Editor B. & T. D. A. A.

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EDITORIAL DEPARTMENT

AT LAST—A NATIONAL ASSOCIATION

When men sufficiently want a thing, they get it. Until they want it to the point of showing somewhat of the "spirit of '76," they do not get it. That accounts for the greatest event in the progress of the Dental profession since its official birth at Baltimore in 1839—namely, the organization at Kansas City, during the past summer, of a National Association. We print upon the first page of this number of THE JOURNAL a summary of that momentous happening, given first

hand by one actively interested and present at the meeting.

Officially and technically this new body has been formed by the reorganization of the old National Dental Association, but virtually it is a spontaneous coming into manhood of our profession throughout the country.

We are beginning with a well-planned but as yet loose-jointed scheme of organization, and an approximate membership of twelve thousand—at the first step head and shoulders the greatest dental association in the world. This is as it should be. Now is needed the support of the 50,000 men concerned in the movement to make compact, perfect and honorable for all time this representative body of a great department of science.

THE JOURNAL joins heartily in the felicitations, and in all good wishes for the future of the National Dental Association.

THE PENDULUM IN THE TAGGART CASE

It is reasonable to suppose that the process of settling upon an equitable basis, and permanently, a question so important to the entire community as the Taggart Case, should require the swinging of the pendulum for a considerable time. Although many worthy individuals believe themselves gifted with a sense of prevision, it does not lie in human nature to grasp new problems at once, foresee their solutions, and state in

dogmatic terms that this or that conclusion is the one which shall stand for all time.

Within a little over a year three contrary decisions have been handed down from the courts in respect to this case. On February 6, 1912, Justice Clabaugh of the Supreme Court of the District of Columbia sustained the Taggart patent covering the method of making a mold, etc., for casting inlays, in the suit of Taggart *versus* Boynton. This decision was reversed by order of the Court of Appeals, February 25, 1913. In the suit of Taggart *versus* Moll in the District Court of the United States, Northern District of Illinois, June 19, 1913, the Court sustained all the Taggart patents. So much for the present status of this famous controversy; for in all likelihood the end is not yet.

Whatever profit may accrue in the long run to Dr. Taggart or to humanity at large, we of an important branch of the medical profession are having our ideas of right and wrong stretched to fit a larger scheme of professional conduct. Our code of ethics has not been advanced to meet the complexity of present day needs, and the growing-pains we have all felt of late may be taken as a healthy sign of progress.

There is a principle of conduct very dear to the physician, which is as old as medical practice: no man shall own or monopolize anything of help or comfort to suffering humanity. This is another way of saying that the interests of no one man shall hamper the wel-

fare of all. But a medical code to be a perfect one should work harmoniously with the broad laws that govern the conduct of men among men, and which seek at all times the highest possible average of justice to all concerned. No physician, for instance, would insist that the farmer who has grown a fine crop of wheat shall have no right in the disposal of the same, on the ground that it is necessary to life and health—or that the butcher, baker and candlestick maker are mercenary and contemptible beings for fixing a price on their wares. Our community of to-day is possible only on the plan of give and take. The produce of a man's hand or brain is of essential use to others; a just recompense from others is essential to his life and happiness—to that reward which is the inalienable right of every individual who does a stroke of useful work.

Far be it from the present writer to abate by jot or tittle the nobility of the unselfish life of the true physician. He is every day called upon to exercise higher moral qualities than men occupied in the so-called trades; but all things are relative: we must not make too heavy demands upon the servant of the human body. This has been done in the past to such an extent that it has often bred hypocrisy more contemptible than open self-seeking. We must allow for the necessary selfishness of each individual, which provides first of all for his own maintenance and that of his family. He must keep *himself* "off the street" before he can

be a valuable citizen. Human nature, like murder, will out; and where we see a man who from force of custom is making undue sacrifices, we may suspect that the hypocrite lurks not far from his elbow.

In former times it was not considered "professional" for the medical man to put a price upon his work. The patient placed an honorarium on the mantel shelf as he took his departure—and the grateful physician took his chances as to the amount contained in that billet. We have grown a long way from that custom, which placed a superior man in a false and dependent position. The physician of to-day renders his bill, and if necessary follows it into a court of law to secure its collection.

The man who spends years in planning and perfecting a device for the amelioration of human suffering performs a service which deserves in an eminent degree fit compensation. If he is wealthy, and chooses to give his invention to the public, he becomes a philanthropist. Most men cannot afford to do this, however strongly they may wish to. The only method of controlling the manufacture and sale of the device or article is under the protection of a patent. Here the medical man is damned outright if he takes such a course. At the present day, and under our antiquated code of right conduct, this deserving man faces the two alternatives: first, to protect his property by due course of law and thereby be ostracized by his professional brothers and the public—or, second, to make

a gift ostensibly to the public, but really to the manufacturers—who devour wolflike his work of years. These companies sell at the best figures possible to the “professional” men, who in turn make round fees from their patients for the improved service they are enabled to give. In either case the plight of the inventor is a sorry one, and one not calculated to tempt ingenious men to labor in that field.

The swinging of the pendulum, however, reminds us of the tyranny made possible through the granting of “process patents.” This is a difficulty to be solved; and one which should be capable of adjustment through laws designed to protect the public and the inventor. To say that the process patent as it now stands would work an injury to the public—therefore let us plunder the villain who tries to get one—is poor logic, and places those who profit by such a course in an unsatisfactory light as to the Eighth Commandment.

The need of readjustment in this department of our code of ethics is painfully clear. Our views must be made to reach new conditions upon our ever broadening horizon of professional life.

NOTES ON PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S., NEW YORK CITY

Tubercular Infection from Dental Abscess.—Dr. Moorehead in the *Journal of the American Medical Association* reported recently five cases of tubercular infection of the glands in close proximity to abscessed teeth, inferring that these glands became infected through the canals of the abscessed teeth. Every dental and medical man knows that from such infected tubercular glands tubercle bacilli can be carried throughout the system, the bacilli attacking any part of the body that is below par. Dr. E. C. Rosenow, of Chicago, reported recently before the Chicago Dental Society six cases, in which the patients had died from endocarditis, the post-mortem examinations showing that the endocarditis was the direct result of poisons absorbed by the blood-stream from pyorrheal pockets containing pus or abscesses associated with teeth. It is time, then, that we stop blinking at these chronic abscesses in the mouths of patients, and if by therapeutics and surgery we cannot cure such conditions, let us extract such teeth in order to avoid damage to the patients' systems.—DR. BUCKLEY, *Dental Cosmos*.

Sprue Former Too Large.—Many failures in casting are traceable to the use of too large a sprue former. This permits the gold when in a highly molten state to descend a short distance in the large sprue hole, and there to become lowered in temperature, thus forming in some cases an obstruction which blocks the passage from the crucible to the mold. So in all ordinary casting, it is preferable to use a relatively small sprue former and one that is cylindrical rather than conical in form.—R. T. WOOD, *Dental Review*.

Mixture of Amalgam with Cement.—Place one-half of a mix of amalgam, when ready to pack, upon a slab, and then drop a proportionate amount of cement liquid into the amalgam. Then add the cement powder, and grind the whole mass as required in mixing the cement to a soft consistency.

Immediately fill the cavity with the mixture, trim the edges, then add the rest of the amalgam, and finish with clear amalgam. The above method well carried out will be a "specific" that will not need an experimental station. To prove the above, cut out the filling a few years hence and be convinced. The cement mixed as described will cut off thermal and galvanic changes and be comfortable in the mouth. The time has arrived when filling teeth with gold or amalgam as a saver of teeth can hardly be called first-class work. Professor Brackett says of the adhesive joint: "It is as much better as a well mortared is better than a dry brick wall in masonry."—L. C. TAYLOR, *Dental Brief*.

Preparing the Wax Core.—When the wax model for a gold inlay has been trimmed to correct form and the surface has been carefully gone over with a very small quantity of oil of cajuput, it is carefully washed off in water and gone over with liquid soap and water. Besides giving a beautiful finish to the wax, it will be found that this treatment enables the operator to paint the investment onto the wax much more readily.—E. S. BEST, *Dental Review*.

On Baking Porcelain.—Porcelain to have its greatest density must be evenly and thoroughly condensed.

All possible moisture must be brought to the surface and absorbed.

A mass of porcelain during the process of baking shrinks toward the center of the mass.

If there is a point for fixation within the mass the shrinkage goes toward that point.

If there are two points of fixation within the mass, the shrinkage goes toward one and pulls away from the other.

If a point of fixation can be placed in the center of the mass, the strongest possible crown is the result.

Two bakings are all that should be given a crown to obtain the greatest strength.

Burnishing the surface of a carved porcelain crown before baking gives a smoother surface to the finished crown.—C. K. BUELL, *Items of Interest*.

Roentgen Diagnosis.—Most men unaccustomed to the

interpretation of radiograms fall into the error of trying to make an etiological diagnosis from the plate. Just as the expression, "kidney stone," is heard in medical parlance, so in dentistry the word "abscess" is employed, when the only conclusion which can be drawn from a radiograph is that of an area, or in a stereo-radiogram, of a cavity of lesser density of tissue. The nature of the contents must find clinical explanation. The words syphilitic, tuberculous, etc., should not be heard in making a Roentgen diagnosis.—THE DR.'S EISEN, *Dental Cosmos*.

Removing Posts.—In removing a post from a root with a post-puller, a piece of German silver is cut to fit over the end of the root and punctured, and the post allowed to project through and then removed. This eliminates the possibility of splitting the root in case the end should be uneven.—E. T. TINKER, *Dental Review*.

Partial Root Excision.—Having fully determined upon the necessity for a partial root excision—and this presupposes that said root has undergone the proper and necessary preliminary treatment, with a final filling inserted therein—the already established sinus is to be increased in diameter by making a slight lateral incision in opposite directions to the opening, this to be followed with a few packings of gauze, which will usually bring into view very distinctly the end of the root. The amount of tissue to be removed will have some influence in determining as to how it can best be accomplished expeditiously. If only a minute portion of the end of the root is to be removed, it can best be done with a suitably selected stone run by the dental engine; if, however, a greater area is involved, I would, first, use a diamond-shaped drill, passing it through the root, and follow this with a fissure burr, cutting both ways until the end is severed. Final smoothing of the roughened stump left by the burr can best be done by using a fine Arkansas stone. Thorough flushing of the cavity with a warm, normal salt solution immediately following the operation places the surrounding tissues in a most favorable condition for future recovery.—J. G. REID, *Dental Review*.

Retarded Dentition.—Among the general pathological

disturbances which bring about deformity or retarded eruptions of the teeth may be mentioned syphilis, the acute exanthemata, such as scarlet fever and measles, and disorders of nutrition, such as rickets and scurvy. Among the local causes are inflammations of the jaw-bones set up by decayed teeth or other disturbances, deformed arches, etc.—M. H. CRYER, *Dental Cosmos*.

Drilling Amalgam Fillings.—Old fissure burrs made into spear point drills and dipped in oil will go through an amalgam filling as if it were butter.—*British Dental Journal*.

Removing Silver Nitrate Stains.—Silver nitrate stains can be quickly removed by applying potassium cyanid solution. They may also be treated with potassium iodid. The yellow silver iodid stains formed thereby on the hands can be removed with mercury bichlorid and ammonium chlorid, 10 per cent. each in 80 per cent. of distilled water.—*Zeitschrift für Zahnheilkunde*.

Importance of Tooth Brushing.—Three-quarters of the success in the treatment for the prevention and cure of so-called "Rigg's Disease," are due to the faithful and skillful home treatment of the mouth by the patient. Not one out of twenty patients knows how to brush the teeth effectively until he is taught. Some do not acquire the knack within less than a year of practice and coaching, but when once acquired, like swimming, the art is never lost. All patients are expected to brush their teeth at least three times a day. After patients have once acquired the habit of having clean sanitary mouths, they would be miserable to go back to the old habit of neglect.—A. C. FONES, *Dental Cosmos*.

Prompt Treatment of Alveolar Abscess.—In all alveolar abscesses, evacuation of the pus and extraction of the offending tooth, if too badly decayed to be preserved, should be carried out early; delay in these cases being dangerous. After opening such an abscess or extracting the tooth, the use of hydrogen dioxid to wash out the cavity should be avoided. This remedy has very frequently been the direct cause of extensive destruction of bone tissue. If, in spite of treatment, the infection progresses, the further care of the case depends

on the course of the disease. In the early stages the application of an ice cap to the affected side of the face, together with pressure by a gauze pad and bandage, will tend to reduce pain and swelling and possibly limit the extent of the infection. When there are indications that pus is present, it should be evacuated, through the mouth, if possible; and, if not, by as small an external opening as is necessary to give thorough drainage.—R. H. IVY, *Dental Brief*.

Importance of Complete Pulp Removal.—Realizing that mummification is but a counterfeit, we are forced to return to first principles in the treatment of pulp removal. This means nothing short of the removal of all the organic matter in the root canals. It is true that in a small percentage of cases roots are found so abnormally tortuous as to make the cleansing of the ends of such canals an impossibility. This percentage is so very small that it can never be used as an argument against the claim that the success of all root canal treatment depends on how completely the organic constituents are removed.—M. L. RHEIN, *Dental Cosmos*.

Hemorrhage Following Pulp Removal.—In the removal of the pulp following pressure anesthesia, hemorrhage from the apex is frequently experienced. If the broach has been cautiously passed up between the canal wall and the pulp to the apex, the pulp when extracted will come out—its apical end first—attached to the end of the broach. This is in most instances immediately followed by a rush of blood. As this floods into the cavity in the tooth it should be at once washed away with water, before it has a chance to clot or stain the dentin. For this purpose a small vulcanite hypodermic syringe with a long needle may be used. The latter can be inserted some distance into the canal, and the blood forcibly expelled. A wisp of cotton wrapped around a broach—an old one with the barbs removed serves the purpose—is then immediately introduced into the canal, so as to fit it tightly and kept there as a plug. In most cases it will be found necessary to repeat the plugging many times. If, after several minutes, bleeding still continues on the removal of the plug, it is best to fill the canal with cotton saturated with adrenalin, and

proceed with the preparation of an adjacent cavity or some other work. Adrenalin is the only drug that should be used in a root-canal after immediate pulp extirpation.—E. B. NICHOLS, *Australian Journal of Dentistry*.

Condensation of Amalgam.—In making amalgam fillings great care and thoroughness should be observed in condensing the material into the cavity. This can only be accomplished by using flat ended pluggers, either serrated or smooth. It is not reasonable to suppose that it is possible to thoroughly condense amalgam into a cavity with a round or ball burnisher. In condensing amalgam, the plugger must be of such form that the material will be carried ahead of it and into contact with the wall of the cavity.

If we consider for a moment what occurs when a round or ball-shaped plugger is used, we shall see the folly of its use in that particular capacity. When a thrust or impact is made, instead of the amalgam being carried against the cavity wall, we see it slipping away from it in all directions, and unless the instrument fairly fills the cavity there is no condensation of the material; but, on the contrary, we see the amalgam bulging up around the instrument and away from the cavity walls.—J. F. WALLACE, *Western Dental Journal*.

CORRESPONDENCE

THE "FISHLINE METHOD" OF WEDGING TEETH

NEW YORK CITY, August 20, 1913.

The Editor, THE JOURNAL OF THE ALLIED DENTAL SOCIETIES:

DEAR SIR: In the January, 1913, *Items of Interest*, Dr. F. T. Van Woert in an article entitled "The Technique of Inlay Making" refers to the use of ligature silk for separating the teeth to be worked upon, and explains the method by descriptive text and excellent illustrations. Too much cannot be said in commendation of this method of wedging, gaining the space as it does quickly, without pain and with but little discomfort to the patient.

Experience in orthodontia teaches us that teeth can be moved a considerable distance with but little soreness, if the gum is not encroached upon; and probably no method fulfills that requirement as well as the one under discussion.

While Dr. Van Woert uses ligature silk, the material generally used in this way is Japanese grass line (also silk), usually called "fishline," and for more than twenty years this method of wedging has been called "the fishline method" by those familiar with it.

In Dr. Van Woert's paper, he gives Dr. Ottolengui the credit of devising the method, while in a foot-note Dr. Ottolengui says: "Dr. Van Woert gives me undue credit. The method was original with me, but was equally original with a number of others."

My knowledge of this method came from Dr. Isaac B. Davenport, of Paris, France, who instructed me in its use early in the year 1893, and so beneficent was its influence in my practice that I called the attention of several New York practitioners to it during that and following years. I also demonstrated the method to the students of the Harvard Dental School at a clinic in February, 1908.

At the meeting of The New York Institute of Stomatology, held at the office of the late Dr. J. Adams Bishop, May 2, 1899, in a sort of symposium of wedging methods, I described

"the fishline method" as my contribution, giving due credit to Dr. I. B. Davenport.

A report of that meeting appeared in the September, 1899, *International Dental Journal*, the description of the method being fully given.

At the Academy of Medicine, December 1, 1908, before The New York Institute of Stomatology, I read a short paper, entitled "Humane Methods of Wedging," in which reference was made to many methods, and the fishline method described as follows: "A piece of waxed dental floss about six inches long is doubled in the center, and through the loop is threaded a piece of the wedging material, also about six inches long. One strand of the dental floss is passed between the teeth to be wedged, and then the other. . . . The floss silk is then pulled between the teeth until the loop of the wedging material appears, when the floss silk should be pulled out of the loop and thrown aside. One free end of the wedge material is then brought over above the teeth, and threaded through the loop, after which an end is taken in each hand and pulled tightly. Care should be taken to draw the loop until it comes between the teeth, and the force used draws the material away from the gum and around the knuckles of the teeth. A square knot is then tied on the cheek side and the ends cut, not too close to the knot."

In this paper the difficulty of securing fishline of the best quality in this country was referred to (what I use is obtained in Paris), and the results of experiments with other materials to be used in the same manner were reported upon.

I suggested the use of Clark's O. N. T. crochet cotton, No. 15, as a fairly satisfactory substitute, inexpensive and obtainable anywhere; satisfactory because experiment proved that the addition of moisture caused it to shrink in length and to increase in caliber. This short paper was discussed by Drs. Karl C. Smith, C. Frank Bliven, S. H. MacNaughton, H. L. Wheeler, H. Griffen Marshall, A. H. Merritt, Chas. O. Kimball, and W. D. Tracy, and the paper and discussion appeared in the March, 1909, number of THE JOURNAL OF THE ALLIED SOCIETIES.

In an interesting editorial occupying seven pages of the March, 1913, *Items of Interest*, Dr. Ottolengui makes some historical references to the progress of wedging methods, describes further advantages possessed by the ligature silk method over others, and fills considerable space assuring readers that the French silk and the method of tying it, as described and illustrated by Dr. Van Woert in the January, 1913, *Items*, had not before appeared in print.

It is a matter of very little consequence, of course, who devised this method of wedging, but inasmuch as Dr. Isaac B. Davenport used it more than twenty years ago, and passed his knowledge concerning its advantages on to many of his colleagues immediately, his name, in all fairness, should be connected with the method for all time.

In my opinion, not one of the many small improvements in dentistry has proved to be of as great value as has the fish-line method of wedging, and my desire to emphasize that value and to encourage all to avail themselves of it, has caused me to write this letter.

SEBERT E. DAVENPORT.

CURRENT NEWS

Items of professional news, of general interest, will be received by the Associate Editor at 51 West Forty-seventh Street, New York City.

The Forsyth Dental Infirmary for Children, now under construction in The Fenway, Boston, Mass., is rapidly nearing completion, and its many departments will begin the work planned for them some time in December of this year, or in January, 1914.

This institution will give assistance to the children on a really immense scale, and it is intended to care for the dental needs of the 220,000 in Boston and its suburbs. The treatment of patients will not be limited to operative and prosthetic work and extracting, as is often the case in the free hospital clinics, for besides these departments there will be special sections of the building entirely given up to prophylaxis, orthodontia, research work and oral surgery, with the finest equipment possible.

There will be sixty-four chairs installed in the operating room alone, and it is expected that every one of these will be in use practically all the time, as soon as the work is really under way.

Director Harold De Witt Cross, D.M.D., will, of course, have general supervision over everything, and at the start his assistants will be as follows: On the full time permanent staff, at a salary of \$1,000 a year, there will be fifteen men, of less than three years' graduation; on the permanent staff for half-time service (twenty-four hours a week) and the permanent staff for one-third time service (sixteen hours a week), there will be approximately eighty men. A salary of \$300 per annum will be paid to the half-time service men, while those on the one-third time service will receive \$100.

All appointments to this permanent staff will be made for either one or two years, and its members will be entitled to the advantages of reports and clinics by experts in the various branches of dentistry, from different parts of the

world. A diploma of service will likewise be issued to every member of this staff who completes his term to the satisfaction of the Director and Trustees.

An idea of the high standard required may be obtained from the fact that, while all members of the permanent staff must be graduates of a reputable dental college and must have a diploma from the Massachusetts State Board, the fifteen full time service men have been chosen from some fifty applicants, and the eighty odd others have been picked from about one hundred and seventy dentists who applied. The appointments were open to both men and women graduates.

Besides its permanent staff, made up as described above, the Forsyth Dental Infirmary will have a large quota of regular visiting dentists, who will give one-half day per week or per two weeks. Fifteen chairs, approximately, will be available for the use of those on the visiting staff, and it can be readily seen that a large number of children can be served by these dentists, in spite of the fact that each will give but half a day a week usually, to the work.

This, briefly, is the full complement of men with which this great institution will begin its career. They will man the various departments referred to, and the good which will be accomplished among the children in and around Boston can hardly be appreciated at the present time.

* * *

Dentistry is the youngest of the professions, and therefore its many benefits, covering as they do, a wide area, have not been taken full advantage of by the uninformed public. In the daily papers of the present day one may read about how "John Smith" was attacked by robbers, but escaped with slight injury, only having four teeth knocked out and sustaining other minor bruises.

A dental convention report in a newspaper may have the heading, "Tooth Pullers in Council," or some like phrase to introduce the account to the readers. The opinion of a Massachusetts motor man on a trolley car is quite to the point. The motor man was discussing his dental troubles. Said he: "It ain't no use wasting money having your teeth filled. I've

tried it and I know. I sunk nearly fifteen good dollars that way during the last twelve months, and what have I got for it? Just as quick as I get the teeth on one side of my head fixed, then on the other side begins to rot."

Every year, however, one may observe a sure advance in the understanding by the masses of the broad scope of dentistry, and consequently there is a constant increase in the number of uneducated people who really are beginning to look upon their teeth as something worth having.

During the last decade a great deal has been done by dentists, school officials, physicians, and others to educate the more ignorant people to take proper care of the oral cavity, and the many free clinics, examinations in the schools, lectures, etc., are practical demonstrations that dentistry will some day be placed by all on the high plane where it belongs. People are beginning to think, and after thinking to act, and consequently their mouths are being benefited.

It is an interesting fact that one of the largest and best known insurance companies in the world which, while an extremely rich concern, does most of its business among the poorer people, has recognized the important bearing the oral cavity has on the general health of the community. Following out this knowledge, the insurance company in question publishes each year a pamphlet called *Teeth—Tonsils—Adenoids*, in which various explanations are set forth in a simple and intelligible way. This pamphlet is sent to all the policyholders of the company, and the result has been most satisfactory.

The little pamphlet begins by explaining the arrival of the teeth of babies, and gives a tentative schedule of eruption that is as nearly accurate as any could be. Photographs of the outside and inside of a tooth are shown, accompanied by statements of "What makes teeth decay" and "What toothache means."

Under the heading, "Keep All the Teeth in the Jaw," the following appears: "The sixth-year molars are the first back teeth of the second set. They are four in number, two in each jaw. Look at the picture and see what happens to

the child if it loses one of these four teeth. See if there are any holes in the teeth. See that the teeth are not crowded. Are they clean? Does your child chew its food well before swallowing it? . . . Save the teeth. Every tooth pulled out causes more wear and work to be put on the other teeth. If there are holes in the teeth, or they need cleaning, go to a dentist—go to the best dentist you can find. Do not go to an advertising dentist or doctor.”

The booklet next discusses and illustrates the first and second teeth, irregular teeth, how to brush the teeth, what to do for bleeding gums, tartar, etc. It advocates the use of dental floss, and winds up with instructions for making tooth powder. It then takes up the subject of “Tonsils and Adenoids” in a similar way.

A little pamphlet of this sort, while not of much assistance to educated people, is of inestimable value to the masses, and will in time make its influence felt in the increased good health of its readers, some of whom must, without doubt, take its suggestions seriously.

The fact that a large insurance company, with all the business it needs, takes the trouble to print and scatter broadcast such a booklet, is one of the signs of the times that people are waking up dentally, and are beginning to realize the wonderful benefit obtained by a proper care of the oral cavity.

DECISION IN TAGGART-MOLL CASE
IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

DECREE

1. The defendant produced in open court evidence to support his charge of anticipation by himself, by Dr. J. O. Ball, Dr. Jacob G. Shottler, W. E. Harper, James H. Prothero and Lucian H. Arnold, and the court having heard said evidence finds that said defenses are not established and that nothing was done by said Ball, Shottler, Harper, Prothero, Arnold, or the defendant Moll in any way anticipating any of the claims in suit.

2. Letters patent Nos. 865,823, 872,978, 983,579 and 983,580, all granted to complainant and covering respectively, "Apparatus for Making Molds for the Casting of Dental Fillings and the Like," "Method for Making Molds for Dental Inlays and the Like," "Method for Making Dental Inlay Fillings and the Like," and "Apparatus for Making Castings" are owned by complainant as charged and that claims 1, 2, 3, 4, 7 and 9 of patent No. 865,823, claims 1 to 12, inclusive, of patent No. 872,978, claims 1 to 13, inclusive, of patent No. 983,579 and claims 2, 3, 4, 6, 7 and 13 to 20, inclusive, of patent

No. 983,580 are good and valid in law over all the references set up in defendant's answer.

3. The court further finds that defendant has without leave or license infringed each and every of the claims enumerated in paragraph 2 hereof by using apparatus for making molds within the claims of patent No. 865,823, by practising the method of patent No. 872,978, by practising the method and producing the inlay fillings set forth in patent No. 983,579 and by making, using and advertising for sale a machine in infringement of patent No. 983,580.

4. The court further finds that claims 5 and 6 of patent No. 865,823 are anticipated by letters patent to M. W. Hollingsworth, No. 708,811.

IT IS THEREFORE ORDERED, ADJUDGED AND DECREED that a writ of injunction issue out of this court perpetually enjoining the said defendant Moll, his agents, attorneys, servants and workmen from further infringement upon any of the said claims of said patents enumerated in paragraph 2 hereof and particularly from further manufacturing, using or selling the apparatus for making molds and the apparatus for making castings which he, the said defendant, has heretofore employed, or from further practising the methods for making molds for casting dental inlay fillings and the method for making dental inlay fillings which he has heretofore employed in infringement of said patents or from making, using, or selling any dental inlay formed entire of cast metal. It is further ordered that this cause be referred to Mr. Charels B. Morrison, a Master in Chancery in this court, to take and state an accounting between the parties in accordance with the statutes and the practice of courts of equity for such cases made and provided.

SUBJECT INDEX FOR SEPTEMBER, 1913

[Abbreviations: disc., discussion; rev., review; edt., editorial; ed., edition.]

- ABSCCESS, ALVEOLAR, importance of prompt treatment (note), 261
- Acids, organic, as salivary stimulants, H. P. Pickerill on, 226
- Amalgam, condensation of (note), 263
- Fillings, drilling of (note), 261
- With Cement, mixture of (note), 258
- Anatomical Dentures, some essential facts pertaining to construction of, J. H. Prothero on, 210
- "At Last—A National Association," edt., 252
- BASE PLATES, construction of, J. H. Prothero on, 216
- Bite, taking of, J. H. Prothero on, 217
- Boston and Tufts Dental Alumni Association, April and June meetings, 250
- CARBORUNDUM POWDER, mixture of, for grinding occlusal surfaces in the month, L. M. Waugh on, 243
- Christensen-Snow occluding frame, J. H. Prothero on, 211
- Clapp, G. W., on anatomical dentures, 244
- Correspondence: The "Fishline Method" of wedging teeth, S. E. Davenport on, 264
- Cuspid teeth, importance of correct occlusion of, 246
- DAVENPORT, S. E., "The Fishline Method of Wedging Teeth," 264
- Dentition, retarded, 260
- Dentures, anatomical, some essential facts pertaining to construction of, J. H. Prothero on, 210
- Diagnosis, Roentgen, caution required in (note), 259
- Dispensary Committee, Mass. Dental Society, report for 1912-13, 230
- FACE BOW, use of, J. H. Prothero on, 218
- Farrar, Dr. J. N., his life and work, James Truman on, 198
- First District Dental Society, S. N. Y., report of meeting Jan. 6, 1913, 237
- "Fishline Method" (the) of wedging teeth, S. E. Davenport on, 264
- Flask, packing of, J. H. Prothero on, 223
- Force, estimation of in closing flasks, J. H. Prothero on, 224
- Forsyth Dental Infirmary, personnel of, 267
- GINGIVITIS, INTERSTITIAL, and Pyorrhea Alveolaris, E. S. Talbot, rev., 273
- Gritman-Snow occluding frame, J. H. Prothero on, 214
- Gysi, the, simplex occluding frame, J. H. Prothero on, 212
- Gysi, the, system of registering condyle path, J. H. Prothero on, 211
- HILLYER, E., on anatomical dentures, 243
- INSURANCE company's pamphlet on dental hygiene, 269
- "Intermittent Force"—J. N. Farrar originates theory of, 203
- KINGSLEY, NORMAN WILLIAM, memorial to, 275
- Knowledge and belief, H. P. Pickerill on, 226
- MODELING COMPOUND, accurate impressions made in, 249
- NATIONAL DENTAL ASSOCIATION (THE), meeting at Kansas City, 195
- New Jersey State Dental Society, officers for 1913-14, 277
- OBITUARY, N. W. Kingsley, 275
- "PENDULUM (The) in the Taggart Case," edt., 253
- Pickerill, H. P., "Knowledge and Belief," 226

- Plaster, physical properties of, J. H. Prothero on, 223
- Porcelain, on baking same (note), 259
- Posts, removing same (note), 260
- Practice, Notes on, 258
- Prothero, James Harrison; "Some Essential Facts Pertaining to the Construction of Anatomical Dentures," 210, disc., 247
- Pulp removal, complete, importance of (note), 262
- Pulp removal, hemorrhage following (note), 262
- ROOT EXCISION, partial (note), 260
- SCHOOL DISPENSARIES, report on, by Dispensary Com., Mass. Dental Society, 230
- Silver nitrate stains, removal of (note), 261
- Specialists in dentistry, J. N. Farrar on, 207
- Sprue former too large (note), 258
- TAGGART-MOLL case, decision in, 271
- Toothbrushing, importance of (note), 231
- Truman, James; "John Nutting Farrar, M.D., D.D.S., His Life and Work," 198
- Tubercular infection from dental abscess (note), 258
- WAUGH, L. M., on anatomical dentures, 237
- Wax core, preparing the (note), 259
- Wheeler, Herbert L.; "The N. D. A. Meeting at Kansas City," 195

BOOK REVIEWS

BY C. FRANKLIN MACDONALD, D.M.D.

INTERSTITIAL GINGIVITIS AND PYORRHOEA ALVEOLARIS. By Eugene S. Talbot, M.S., D.D.S., M.D., LL.D. 340 pages with 102 illustrations. Ransom & Randolph Co., Publishers, Toledo, Ohio, 1913.

The subject of interstitial' gingivitis and of pyorrhea alveolaris in this day has assumed great importance. One which at first was considered to be a more or less local affair has proved to be of singular complexity and correlated with serious general pathological conditions. The awakening of the dentist to what this disease may mean and its possible involvements is undoubtedly due, in great measure, to the earnest enthusiasm and persistent investigation of Dr. E. S. Talbot.

The results of his studies have given rise to this book of over 300 pages. To read this book one must be impressed with the past work and careful thought which this subject has brought forth.

While some of the theories may be open to criticism and modification and at times enthusiasm seems unduly present; the importance of understanding this disease and its underlying causes is made most convincing, and every effort is directed to show that this field has been but little understood and demands in the future much careful study.

After finishing this treatise, it will be difficult to find something even remotely connected with this disease which the author has not considered. At times it rather seems as though these remotely connected phases have been unduly dwelt upon.

The theory that the alveolar process is a transitory structure and end organ, hence peculiarly liable to response and changes under constitutional derangements, seems well taken, as the author explains it; and it is upon this basis that the

disease has been studied. The author while laying the most stress upon the constitutional factors as the main reasons for interstitial gingivitis, likewise considers local causes as serious factors under certain conditions.

Dr. Talbot states that "The process of absorption of the alveolar process and the building up of new bone around the first and second set of teeth is inflammatory. This then is the beginning of interstitial gingivitis in the life of every individual." This statement seems hard to accept, and a little as though the result of over-enthusiasm, because it hardly seems that one can classify a physiological process, even though it be carried out in a way simulating inflammation, with interstitial gingivitis resulting from pathological inflammation. Especially as later the author claims, that inflammation once set up "is progressive in its nature and does not cease until the tooth or teeth have been exfoliated by the absorption of the alveolar process, although treatment, changes in environment and systematic conditions may check the disease for a limited time." The conclusion to be drawn is that all persons are going to have interstitial gingivitis. Many will probably take exception to his latter statement to the effect that once started this disease cannot be cured but simply checked. It seems almost that one might say, Yes; when you get sick we can stop you from dying, but you will certainly die some time.

However, the author has given a most thorough presentation of this subject, and in support of his theories generally presents much experimental evidence, which is helped by numerous excellent micro-photographs.

Pyorrhea Alveolaris is considered to be usually a phase of the greater subject, Intestinal Gingivitis, and is simply a complication which follows, and in which the pus producing organisms play an important role.

The treatment of this disease from the dental standpoint is shortly and concisely given, bearing entirely upon local treatment. The author undoubtedly presumes that the constitutional factors, when causative, will receive proper attention.

Much of the text deals with matters of theory, and the best advice is, read carefully and draw your own conclusions.

The book is worthy of thoughtful reading, and while, in many places, it may delve into depths beyond the average dentist, all will get an amount of valuable information from it, and should be impressed with the importance of interstitial gingivitis as a vital problem awaiting solution.

OBITUARY

NORMAN WILLIAM KINGSLEY, M.D.S., D.D.S.

Dr. Norman W. Kingsley, an associate member of the American Academy of Dental Science, died February 20, 1913, at his home in Warren Point, N. J.

Norman William Kingsley, M.D.S., D.D.S., of New York City, was born in St. Lawrence County, N. Y., October 26, 1829, and was a son of Nathaniel and Eliza (Williams) Kingsley. He was married in 1850 to Miss Alma W. Shepard, daughter of the Rev. Silas E. Shepard, of Troy, Pa. He became a student of dentistry under his uncle, Dr. A. W. Kingsley, of Elizabeth, N. J. In October, 1850, he began practice in Owego, N. Y.; and in May, 1852, became a partner of Dr. Solyman Brown, on Washington Square, New York City. In 1864 he went abroad, and was received with distinction by the medical and surgical societies and the Odontological Society of London, and in Paris by the French Academy of Medicine; before each of which he read essays. In 1865 he returned to New York, and in that and the following year organized the New York College of Dentistry, of which he was Dean and Professor of Dental Art and Mechanism for three years. In 1867 he published a series of monographs, entitled "Dentistry as a Fine Art." He was one of the founders of the New York State Dental Society in 1868 and twice president of the same. He was president of the New York State

Board of Dental Censors for sixteen years, and formerly a member and president of the First District Dental Society and of the New York Odontological Society. He was an honorary member of the American Dental Society of Europe, the Odonto-Chirurgical Society of Scotland, the Odontographic Society of Philadelphia, the International Medical Congress (London, 1881), and many others.

Dr. Kingsley was the author of "A Treatise on Oral Deformities," the first text-book ever published on the scientific treatment of irregularities of the teeth.

As an artist, Dr. Kingsley achieved considerable fame, principally in sculpture. His most notable work was a portrait bust of Whitelaw Reid, which was cast in bronze, and is now in the Lotos Club, New York, of which Dr. Kingsley was long a member.

New York State has produced many of the pioneers and leaders in dentistry, but it is safe to say that no one of them all has done more than Dr. Kingsley for the real elevation of his profession. By his talents he has shown that the highest type of dentist is a composite being; a master mechanic; both an artisan and an artist; a professional man and a scholar; and, above all, a Christian gentleman. Those of us who knew him know that a good friend, and a brilliant man, has gone to his rest. While feeling the loss of our associate fellow, we cannot but rejoice in his splendid record of achievement, covering a long and useful life.

R. R. ANDREWS,
T. O. LOVELAND,
H. A. BAKER.

Committee.

Boston, Mass., May 7, 1913.

NOTICES

OFFICE OF SECRETARY,
430 East State Street, Trenton, N. J.
August 8, 1913.

Editor, THE JOURNAL OF THE ALLIED DENTAL SOCIETIES, *New York City*.

DEAR SIR: The following is a list of officers elected at the annual meeting of the New Jersey State Dental Society, held at Asbury Park, N. J., July 16-18, 1913:

LIST OF OFFICERS.

President, Wm. H. Gelston, D.D.S., Camden, N. J.

Vice-President, Walter F. Barry, D.D.S., Orange, N. J.

Treasurer, Chas. F. Jones, D.D.S., Elizabeth, N. J.

Secretary, John C. Forsyth, D.D.S., 430 East State Street, Trenton, N. J.

EXECUTIVE COMMITTEE: Walter F. Barry, D.D.S., Chairman; Henry Fowler, D.D.S., Harrison, N. J.; James I. Woolverton, D.D.S., Trenton, N. J.; Joseph Kussy, D.D.S., Newark, N. J.; Edwin W. Harlan, D.D.S., Jersey City, N. J.

MEMBERSHIP COMMITTEE: A. S. Burton, D.D.S., Asbury Park, N. J.; Franklin Rightmire, D.D.S., Paterson, N. J.; J. F. Crandall, D.D.S., Atlantic City, N. J.; A. L. Westcott, D.D.S., Atlantic City, N. J.; Dr. H. B. Van Dorn, Red Bank, N. J.

Very truly yours,

JOHN C. FORSYTH, Secretary.

THE JOURNAL

OF THE

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No. 4

THE BUFFALO CONVENTION ON SCHOOL HYGIENE

It can safely be said that at no previous convention of the International School Hygiene Association has so much attention been given to the hygiene of the mouth as was given at the convention held at Buffalo last August. Not only were there two morning sessions, both of which were well attended, but the first evening's general session was devoted entirely to the Mouth Hygiene campaign. At this session there were from 2,300 to 2,500 present. Dr. Eliot, the president of the convention, sat on the platform, and also spoke. The chairman of the meeting was Dr. W. G. Ebersole, of Cleveland, Ohio. It might be well to say right here that it was owing to the untiring efforts of Dr. Ebersole that so much time and attention was devoted to Mouth Hygiene, and from the remarks heard on all sides it attracted much attention and created much discussion. The interest created is being carried to all parts of the world, and it will be interesting to see what results will be shown at the next convention.

At the morning session, held Tuesday, August 26, the following papers were read:

"Dental Hygiene and Dental Clinics in Schools." Dr. Ernest

Jessen, Strassburg, Germany. Read by H. D. Cross, Director of Forsyth Dental Infirmary, Boston, Mass.

"Mouth Hygiene in the School Curriculum." Albert H. Stevenson, D.D.S., Chairman, Committee on Public Health and Education, Second District Dental Society.

"What We Are Doing in Mouth Hygiene on the Pacific Coast." M. Evangeline Jordon, D.D.S., Los Angeles, Cal.

"The Educational and Economic Value of School Dental Inspection." Sidney J. Rauh, D.D.S., Cincinnati, Ohio.

At the morning session held Wednesday, August 27:

"The Chief Points of the Present Mouth Hygiene Work in Europe." Dr. Albin Lenhardtson, Stockholm, Sweden.

"Ideal Methods of Spreading the Oral Hygiene Propaganda in Communities." Dr. George F. Burke, Detroit, Mich.

"The Dental Phase of School Hygiene and of Public Health Problems." Homer C. Brown, D.D.S., Columbus, Ohio.

"Mouth Hygiene Work in Peru." Dr. Humberto Fernandez Davila, Lima, Peru.

"Ways and Means." T. W. McFadden, D.D.S., Wilkesburg, Pa.

"Public School Dental Clinics a Possibility in Each Community; A Practical Plan of Securing and Maintaining Them." W. G. Ebersole, M.D., D.D.S., Cleveland, Ohio.

Evening session August 26:

Chairman, W. G. Ebersole, M.D., D.D.S.; Secretary-Treasurer National Mouth Hygiene Association, Cleveland, Ohio.

Vice-Chairman, H. D. Squire, D.D.S.; Dean Dental Department, University of Buffalo, Buffalo, N. Y.

"Mouth Hygiene: Its Relation to the School Child, Mentally and Physically." Thaddeus P. Hyatt, D.D.S., New York, N. Y.

Illustrated Lecture. "Mouth Hygiene: What it Did for Us, and What it Will Do for You." Miss Cordelia L. O'Neill, Cleveland, Ohio, Principal Marion School, Member of the Board of Governors of the National Mouth Hygiene Association, and President of the Cleveland Auxiliary of the National Mouth Hygiene Association.

"What Mouth Hygiene Did for One of Our Girls: A Remarkable Case." Miss Lillian Murney, Cleveland, Ohio, Principal of Murray Hill School.

"Would This Plan Solve the Main Problem for Hygiene in Our Public Schools?" Alfred C. Fones, D.D.S., Bridgeport, Conn., Chairman of the Oral Hygiene Committee of the National Dental Association.

Illustrated Lecture on "Oral Hygiene: A Plan for Extension of the Field." Edwin N. Kent, D.D.S., Brookline, Mass., President of the Dental Hygiene Council of Massachusetts.

In the remarks made by the celebrated surgeon, Dr. Mayo, at a dinner in Chicago, he made the statement that the most important factor in preventive medicine was the care of the mouth, and then asked: "Will the dentists do it? It is not enough that a few members of our profession see and appreciate our responsibilities. What is now needed is that every man who reads the reports in our dental journals, and in the public press, and who believes in the nobility of our work, should come out and say so. The support of every member is needed. Not the support that comes from non-resistance, but the support that comes from positive action. Realize that the more important our work becomes in the welfare and upbuilding of mankind, the more important and the more appreciated do we become in our relation with our fellowmen. Then let us all grasp and be worthy of the honor

and recognition being held out to us. This recent International School Hygiene Convention should mean much to us. I doubt if ten or fifteen years ago it had been possible to have attracted five hundred persons to a Dental Hygiene Conference, and there were over two thousand present at this evening meeting. And please remember the kind of an audience that it was.

I do not believe that anything has taken place in the history of dentistry that commences to be as important, nor of such wide-reaching influence as this convention.

THADDEUS P. HYATT.

A FURTHER STUDY OF DENTAL CARIES¹

BY ALFRED P. LOTHROP AND WILLIAM J. GIES.

(Biochemical Laboratory of Columbia University, at the College of Physicians and Surgeons, New York.)

I. INTRODUCTION.

Mr. President, Ladies and Gentlemen: Our pleasure to-night, in presenting to you our fourth annual statement, is marred by the unavoidable absence of Dr. J. Morgan Howe, the chairman of your research committee, who, from the beginning of our work, has been one of the most interested and appreciative auditors at the meetings devoted to consideration of our reports. Our association with Dr. Howe, since his proposal to us four years ago to inaugurate an investigation of dental caries, has been both an honor and a privilege. He has revealed to us the spirit of research in its finest manifestation—the experience and judgment and idealism of old age appealing to the unselfishness and fidelity and vigor of youth. His ardent interest in the development of measures for the effective prevention of dental disease has been a great stimulus to us in our humble efforts, and his earnest seeking for the truth that others may be served, has been an inspiration. We deeply regret the illness that prevents his presence here to-night; and we voice, we are sure, your sentiments as well as our own when we express the hope that many more years will be added to the great number which he has made years of distinguished service.²

¹This report was presented extemporaneously by the senior author, at a meeting of the First District Dental Society of New York, at the N. Y. Academy of Medicine, October 6, 1913. The substance of the address, as given in this official stenographic report of it, has been edited by the authors, who added to it various chemical details which were referred to in a general way by the speaker and promised for the published account of the research. The previous papers, in this series, were published in this journal as follows: 1910, vi., p. 262; 1911, vi., pp. 65, 289, 297, 323 and 334; 1912, vii., pp. 199, 397 and 410.

²At this point Dr. Gies digressed a few minutes to state that the editorial reference to his work that recently appeared in the *New York Times* had been prepared, without consultation with him, from a reprint of the last annual report by him and Dr. Lothrop as published in the December (1912) issue of this journal. This reprint was one of a number which had been forwarded, without comment, to the editor of the *Times* in response to a circular letter asking scientific investigators to forward published papers that might be of service to the *Times* in its general purpose to present to the public, from time to time, the results of research. The "interview" that appeared in a succeeding Sunday issue of the

II. A RÉSUMÉ OF THE FINDINGS OF PREVIOUS REPORTS.

Permit us, before we proceed with our report, to remind you of the general steps in our progress during the past four years.

In his address a year ago, the senior author made the following statement:³ "Several months after your president, Dr. Howe, invited me, in 1909, to take a practical interest in the subject of dental caries, I had the pleasure of meeting the members of your Research Committee at an informal session. Although I frankly stated that I knew too little about the subject to speak learnedly regarding any phase of it, I presented several ideas regarding possibilities and plans. I suggested (1) that dental caries might be due to the action of microorganisms upon carbohydrates on and between the teeth, *localized* in both cases by 'adhesive mucin masses,' or by other mechanical fixations.⁴ I also expressed the belief (2) that the disintegration of 'adhesive mucin masses,' or their prevention, might be an important feature of prophylactic treatment against dental caries; (3) that both disintegration and prevention might be accomplished satisfactorily with dilute acid; and (4) that 'food acids' (the typical fruit acids and their acid salts) might be effectively used for such purposes.⁵ My direct proposal to Dr. Howe, prior to the committee meeting to which I refer and the plan on which we had been proceeding, was a preliminary study intended to reveal, if possible,

Times was prepared, also without any assistance from Dr. Gies, from a reprint of a short paper in the May issue of the *Household Arts Review*—a journal published by the students of Teachers College, Columbia University. This "interview" made it appear that Dr. Gies had been questioned by a reporter and had answered the questions; but the questions were imaginary and the answers apocryphal. These publications in the *Times* were responsible for many similar references (chiefly quotations from the *Times*) in papers from all parts of the country; they started a deluge of personal letters of inquiry, and created erroneous impressions in great number. Dr. Gies made it evident that he objects to premature scientific discussion in newspapers, and has not and will not engage in them. He also insisted that he must not be held responsible in any degree for any misuse of his formal statements in such scientific publications as this journal. His sensitiveness on this point was due, he said, to his conviction that earnest research and personal exploitation are incompatible, and that the latter would tend to discredit the motives underlying the former.

³ Gies: *Journal of the Allied Dental Societies*, 1912, vii., p. 400.

⁴ The suggestion regarding microorganisms was a mere statement of the prevailing physiological opinion, but the speaker imagined the idea about *local* fixation of microorganisms and carbohydrate by "adhesive mucin masses" was new. He soon learned that Dr. Kirk had previously emphasized the same conception.

⁵ These views were based on many years of experience in the work of precipitating mucins and mucoids, on the general physiological knowledge that salivary secretion is stimulated by fruit juices, and in the opinion that acid fruit juices could do no damage to enamel during their *transient* appearance in the mouth.

any existent relation between the composition of the saliva and the condition of the teeth of people in dental health and disease."

In a previous address (February 19, 1912) the reasons for the first steps in our research were stated by the senior author as follows: ⁶ "Although my past experiences with mucin and its glycoprotein relatives tempted me to propose a research aimed directly at my supposedly new theory regarding mucin as an etiological factor in dental caries, I felt that it would be best to ignore all opinions in the literature, as well as my own preferences, and to 'begin at the beginning' with a quantitative study of the possible relationships between salivary composition and the condition of the teeth. It seemed most logical to assume at the start an etiology (1) dependent primarily on extradental conditions and (2) discernible from variations in the most voluminous (though the most changeable) of the materials in the oral environment—the saliva. *Does the saliva vary in composition definitely and symptomatically with variations in the conditions of the teeth?* This was the question that I raised for our guidance in the first of our inquiries into the subject."

Our first report (1910) answered this leading question in the negative. We said: ⁷ "Our data fail to show any definite relation between the general composition and qualities of a given fraction of saliva and the condition of the teeth of the individual secreting it. This fact has made it seem inexpedient to conduct a more detailed inquiry, at present, into purely salivary features of leading types of dental disease processes. That the *systemic condition* of the individual is an important factor in susceptibility to dental caries is a conviction that we cannot dismiss. *Nevertheless, direct external attack upon teeth by micro-organisms appears to be the most important single factor in the carious processes.* Mucinous plaques afford favorable conditions for such external attacks. We shall be glad, with your approval, to *project our further study along bacterio-chemical lines*, in the hope that much more light can

⁶ Gies: *Journal of the Allied Dental Societies*, 1912, vii., p. 211.

⁷ Lothrop and Gies: *Ibid.*, 1910, v., p. 283.

be thrown upon the very interesting and important, though elusive, facts of dental decay."

The first item in a "memorandum, on plans for further work," at the conclusion of our second paper on the first year's work,⁸ was this: "Ascertain the most favorable conditions for the growth and cultivation of micro-organisms connected directly or indirectly with the leading types of dental disease."⁹

In accord with these developments, our second year of work was devoted chiefly to the study of oral micro-organisms and related bacterio-chemical subjects. We also continued certain phases of the work on saliva, and considered the origin and significance of salivary sulfocyanate.

It was shown that variations in the occurrence and proportion of nitrite in given specimens of saliva were influenced by oral micro-organisms, but that such variations did not indicate anything definite regarding the condition of the teeth of the individual concerned.¹⁰ It was suggested that "much has been learned regarding salivary sulfocyanate, but little that is definite has any bearing on the important problem of dental caries."¹¹ From the results of our bacterio-chemical studies we drew the following conclusions:¹²

"Isolation of pure cultures of mouth bacteria has been unsuccessful except in a few cases. The cultivation of these bacteria on ordinary laboratory culture media presents unusual difficulties.

"Production of acid and a consequent precipitation of mucin have been observed in glucose-mucin solutions by the growth of bacteria from immune as well as badly decaying teeth. The mucin was thrown down as a flocculent precipitate, not in the form of plaques.

"There is acid production in glucose and maltose broth cultures regardless of the condition of the mouth and teeth of the individual from whom the bacteria are taken.

"Calcium is dissolved from natural extracted teeth by the products of bacterial growth in sugar bouillon inoculated from cultures of bacteria taken from both immune and diseased mouths. Cultures of bac-

⁸ Lothrop and Gies: *Journal of the Allied Dental Societies*, 1911, vi., p. 91.

⁹ The sixth item in that memorandum was the suggestion to "study the action of food acids on the enamel and dentin of natural (extracted) teeth."

¹⁰ Smith and Baker: *Journal of the Allied Dental Societies*, 1911, vi., p. 323.

¹¹ Baker and Gies: *Ibid.*, 1911, vi., p. 289; also Gies: *Ibid.*, p. 334. The "sulfocyanate problem" has been studied by Gies and collaborators under the auspices of the Dental Society of the State of New York. See *Dental Cosmos*, 1910, lli., p. 1141; 1911, liii., p. 1324; 1913, lv., p. 40.

¹² Lothrop: *Journal of the Allied Dental Societies*, 1911, vi., p. 319.

teria from the mouth of Miss D., a case of perfect immunity, extracted practically as much calcium as any culture from decay cases.

"Present methods for observing artificial plaque formation are unsatisfactory and further investigation, especially with salivary mucin, is of the utmost importance.

"Investigation into the chemical and physico-chemical nature of salivary mucin is essential, especially in view of its probable relation to deposits or plaque formations upon the teeth under, and in which, bacteria are sheltered and where they carry on the destruction of the tooth structure. Details of preliminary experiments performed in this connection have not been included in this paper because of our desire to investigate the matter further before discussing it."

The work for the third year was projected directly into the heart of the mucin problem. Special attention was given to the preparation of pure salivary mucin, and typical physiological salts of it, for use in studies of mucin plaques and the action of food-acid media on mucinous formations upon the teeth. By an interesting coincidence we were engaged in this latter work, to the desirability of which each of our annual reports had referred, when Pickerill's splendid contribution to dental science appeared, making our efforts all the more interesting because of their timely bearing on his extensive data. Our report for the year presented a special summary of Pickerill's findings, with a statement of our own independent results on related subjects,¹³ together with an account of preliminary preparations of our mucin products, their properties, and their availability for the projected studies of the dental relationships of salivary mucin.¹⁴

In harmony with the indications of our last annual report, we have continued the study of a possible prophylactic influence of food-acid media; but, as usual with difficult work, we have found it impossible to complete the programme as we projected it.

III. CONTINUATION OF THE STUDY OF A POSSIBLE PROPHYLACTIC INFLUENCE OF FOOD-ACID MEDIA.

1. INFLUENCE OF ACID-PRODUCING BACTERIA IN THE FOCAL PRECIPITATION OF SALIVARY MUCIN UNDER RELATIVELY LARGE MASSES OF UNAFFECTED COLLOIDAL MATTER (WITH DEMON-

¹³ Gies: *Journal of the Allied Dental Societies*, 1912, vii., p. 397.

¹⁴ Lothrop: *Ibid.*, p. 410.

STRATIONS). Much has been said about mucin plaques and the probability that such mucinous formations favor lodgment of bacteria and carbohydrate on teeth, and thus facilitate the inauguration and continuance of carious processes. Three years ago we laid special stress on our previously expressed opinion¹⁵ that salivary mucin is involved in the inauguration of the carious process, and is probably concerned in the origin of the bacterial plaque. We said: "It is our conviction that salivary mucin favors the onset of dental caries by facilitating local attack by micro-organisms. We think this favoring action is primarily a physical one, dependent on the viscosity of mucin solutions and the consequent stickiness of mucin layers or deposits.¹⁶ Bacteria and fungi would be entangled and held in such sticky films on teeth, but would not be affected unfavorably in their growth and multiplication there by the contained mucin or mucin salts. *In fact, both mucin and its salivary salts provide nutrient material for micro-organisms.*"

Miller¹⁷, Kirk¹⁸, Jones¹⁹ and Pickerill²⁰ are among those who have expressed similar views, although some of these authors ascribe special rather than incidental *adhesiveness* to mucin which has been *precipitated* by fermentation acid.²¹ No one, however, seems to have directly *demonstrated* that acid, formed under, or in, a colloidal mass comparable to a mucin plaque on a tooth, tends to accumulate at the point of production and there causes localized chemical alterations before it diffuses away from the focus of formation.²² Past considerations of this matter have been essentially theoretical. We have tested it experimentally.

¹⁵ Lothrop and Gies: *Journal of the Allied Dental Societies*, 1910, v., p. 269.

¹⁶ "Deposits" was intended to mean *precipitates in the physical, not in the chemical, sense.*

¹⁷ Miller: *Dental Cosmos*, 1904, xlv., p. 981; 1905, xlvii., p. 1293.

¹⁸ Kirk: *Ibid.*, 1910, lli., p. 729.

¹⁹ Jones: *Dental Review*, 1911, xxv., p. 1167.

²⁰ Pickerill: *Prevention of Dental Caries*, 1912, p. 181.

²¹ *Precipitation with acid (chemical precipitation) reduces the tendency of a given amount of mucin to adhere to the surface of a tooth, but lodgment of precipitated mucin, as of other particles, in mucin films, in crevasses, etc., would induce the condition that is often ascribed to the chemical precipitation of mucin. Flakes of mucin manifest adhesiveness if mucin solution covers them.*

²² Jones has recently commented on this particular phase of the matter (*Dental Review*, 1911, xxv., p. 1167). He produced plaques upon sections of dentin in a maltose-mucin medium by the action of mouth microorganisms and believes that the primary precipitative effect of acid products upon the mucin of the saliva, *thus creating physical protection as well as a dialysing membrane*, is a potent factor in the production and retention of deleterious products upon the teeth and in the mouth.

In a previous report²³ we indicated that bacteria from immune as well as badly decayed teeth, produced acid, and consequent chemical precipitation of mucin, in glucose-mucin solutions. These results were obtained, with mixed cultures, by inoculation of the culture medium with saliva or tooth scrapings. In our latest experiments we have studied the precipitation of mucin by individual types of mouth bacteria, isolated in pure cultures. We raised the question: Is it possible to demonstrate experimentally the production of fermentation-acid, and a consequent focal precipitation of salivary mucin, under large masses of unaffected colloidal material similar to that in mucin plaques?²⁴

The following method proved very effective for demonstrations of the intracoloidal production of acid and the precipitation of mucin as consequences of the growth of pure cultures of the bacteria that are primarily involved in the inauguration of dental decay. In the center of the bottom of a small, sterile, Petri dish was placed a sterile glass ring about one-half an inch in diameter. The dish was put on top of a beaker full of ice water and a sterile aqueous agar solution (1.5 per cent.) was poured into the dish, outside the ring, to the depth of about one-eighth of an inch. After solidification of the agar, the glass ring was removed with a sterile platinum wire, leaving a depression in the center of the mass of agar. Into this depression was poured a small amount of nutrient gelatin medium, colored blue with litmus and containing 1 per cent. of glucose and about 0.8 per cent. of the sodium salt of salivary mucin (preparation VIII pre-

²³ Lothrop: *Journal of the Allied Dental Societies*, 1911, vi., p. 313.

²⁴ Goadby (The Mycology of the Mouth, 1903, p. 148) has classified the organisms of dental caries in two groups, the acid forming bacteria and the organisms which liquefy decalcified dentin. The former class is composed of *Streptococcus brevis*, *Staphylococcus aureus* and *albus*, *Sarcina lutea*, *aurantiaca* and *alba*, and *Bacillus necrodentalis*. All these organisms produce acid from carbohydrate under favorable conditions. Some of them were used in this connection. We were able to obtain pure cultures of *Streptococcus brevis*, *Staphylococcus aureus* and *albus*, and *Sarcina lutea* and *aurantiaca*. The *Bacillus necrodentalis*, which is found in the deep layers of carious dentin, was not available. The *Streptococcus brevis* was obtained from Dr. James G. Dwyer, of the Department of Bacteriology of Columbia University, to whom we are greatly indebted for his kindness. This organism (the *Micrococcus nexifer* of Miller: Microorganisms of the Human Mouth, 1890, p. 88) has been fully described by Goadby (loc. cit., p. 87 and 150), who reports that he has never failed to find it; and also that it is not pathogenic when injected subcutaneously or intraperitoneally. Our findings differ from Goadby's in that the typical *brevis* form was not found as frequently; and, while streptococci were observed in every mouth, it was only after cultures had been taken from fifteen mouths that a typical *non-pathogenic brevis* form was isolated.

viously described²⁵). Before the gelatin hardened, the mixture was thoroughly inoculated with bacteria. After solidification, another volume of melted agar (cooled almost to the congealing point) was poured on the first stratum and allowed to harden. Over all was then poured a layer of agar in 1 per cent. carbolic acid solution, which completely excluded contamination by organisms from the air. If a non-carbolized layer is not placed between the gelatin and the carbolic agar in such mixtures, some of the carbolic acid diffuses into the gelatin and all growth is inhibited. The gelatin center was absolutely transparent when observed in a strong light. These stratifications were physically analogous to the mechanical depositions in the production of mucin plaques.

At room temperature, production of acid was indicated by the gradual reddening of the central gelatin, but no precipitation of the mucin was observed prior to the liquefaction of the gelatin by the bacterial proteases. By incubation at 37.5 degrees C., precipitation was hastened because the gelatin was liquefied and the growth stimulated. Precipitations occurred as soon as the fermentation-acid attained an adequate concentration, when the mucin separated as white flakes and, under conditions of quiescence, settled through the liquefied portion of the medium to the bottom of the dish. (Specimens were demonstrated. Localized liquefaction in the reddened gelatin-center became specially evident when, with the bottom broad-side before the eyes, the dish was quickly revolved through about 45 degrees and the movement reversed. Mucin flakes were then seen to swim through the red liquid medium in the direction of the last turn.)

Typical results were obtained promptly with *Streptococcus brevis* and *Staphylococcus albus* and *aureus*. In the case of *Sarcina lutea* and *aurantiaca*, a very long period of time elapsed before precipitation occurred. The latter organisms are acid producers, but quickly lose the power to produce acid when grown on artificial media; and the available cultures had lost that power to a marked extent. With *Streptococcus brevis*, the most common of the mouth organisms, acid production

²⁵ Lothrop: *Journal of the Allied Dental Societies*, 1912, vii., p. 425.

was rapid in all cases and mucin precipitation abundant.

The colloidal masses thus prepared and treated were massive analogues of mucin plaques. Our results with them in gross appear to be identical in principle with the results in miniature under mucin plaques on teeth. There was chemical activity of bacteria lodged in a colloidal nutrient medium, with ensuing localized production of acid—acid that precipitated the mucin in the immediate vicinity, *without rapidly diffusing away from the place of fermentation (surface of the bottom of the dish) or disorganizing the overlying protective mass!*

We intend to perfect this method; and, after applying it to teeth, hope to present, in our next report, results with our mucin preparations that may bear more directly on the possible relation of mucin plaques to the dissolution of enamel and consequent exposure of dentin, in the carious process.

2. CHEMICAL PRECIPITATION ("CURDLING") OF MUCIN FROM SALIVA BY TYPICAL FOOD-ACID MEDIA (WITH DEMONSTRATIONS.) If mucin plaques favor the fixation of bacteria and the lodgment of carbohydrate on the teeth, with consequent local production and focal action of fermentation-acid, it is obvious that suitable means to prevent the deposition of mucin plaques, or to disorganize them after their formation, might afford effective prophylactic intervention. In our preceding annual reports we have emphasized the special virtue of food-acid media for such a purpose (to "*keep the teeth clean*"), as against the supposed advantages of alkaline dentifrices, because of (a) the chemically precipitative (curdling) effect of food-acid media on mucin solutions (thin, viscid, or semi-solid); (b) the comparative non-adhesiveness of mucin curds; (c) the ease with which the mucin curds or flakes can be brushed from dental surfaces; (d) the destructive effect of the acid substances in such media on the oral micro-organisms; and, incidentally, (e) the temporary though helpful *stimulating* effect of such acid media on the after-flow of saliva. Our emphasis on the utility of media of this kind for such purposes has been warranted by the universal dietary use of fruits and fruit juices. If we may *eat* apples and oranges without fear of damage to the teeth, what can be the objection to rea-

sonable application of the same kinds of juices as frequently to the teeth with a brush?

In our experiments on the effects of food-acid media, *vinegar* has been occupying the most prominent place because of the convenience and satisfaction with which it may be obtained abundantly, conserved perfectly, and used accurately. Furthermore, by testing our prophylactic theory with the food-acid medium which, next to lemon juice, appears to possess the highest acidity (is "one of the most dangerous," let us assume), we shall surely avoid certain errors of experimentation which often ensue from the selection of specially favorable conditions for the establishment of a particular conclusion. "Vinegar seems to be one of the most dangerous food-acid media for employment as a dentifrice." Granted! That is the best reason for its use in our experiments. If we find that *it* is harmless, the finding will be, in effect, a blanket-conclusion!

That mucin is readily precipitated from its salts and from saliva by the acid substances normally present in fruit juices was shown in one of our demonstrations last October. That food-acid media must vary in this power is obvious. With a view to making suitable selections of acid carriers for future studies of effective prophylactic media, we have lately determined the limits of dilution, of several typical fruit juices, at which mucin may be precipitated by the concentration of acid present in the diluted juice.

For this purpose we selected lemon juice, vinegar, and orange and apple juices, which manifest acidity, per unit of volume of juice, in approximately the convenient ratios, 16, 8, 2, 1. Neutral solution of mucin (sodium salt) was poured into a small watch glass and a few drops of the diluted juice were allowed to run into the solution on one side in such a way that the acid fluid gradually mixed with only about half of the mucin solution. In case of precipitation, a distinct turbidity could be seen in the mixture containing acid when compared with the portion of mucin solution that was not mixed with the acid solution.

Precipitation was induced with acid solutions at the following limits of dilution: Lemon juice, 1 (part) in 256 (parts

of water); vinegar, 1 in 128; orange juice, 1 in 32; apple juice, 1 in 16. Below these limits precipitation did not occur. When mucin solution and the diluted acid media were mixed in small test tubes, mucin soon flocculated and then sedimented. It is evident that the "limits of dilution" are proportional to the original degrees of acidity of the undiluted juices, and that small proportions of acid are effective precipitants.

These results pave the way to determinations of the *lowest degree, and the kind, of food-acid acidity best adapted for prophylactic purposes*. We hope to learn much more in this connection before we present our next annual report. It would be premature for us or any one else to assume that this, that or the other acid medium is "the best" as a dentifrice. *No one knows!* The facts must be determined by experiment. We wish to warn all concerned against arbitrary conclusions on this point at present.

3. ANALYTIC DATA ON THE ACIDITY OF SOME COMMON FRUIT JUICES IN STANDARD TERMS.²⁶ The foregoing comparative data apply to four of the most common food-acid media from a particular standpoint. In order, however, to gain the knowledge necessary for suitable selections of food-acid media for various purposes in our researches, we ascertained, as a first step in this direction, the comparative degrees of acidity of a fairly large number of fruit and vegetable juices in terms of a definite standard—*i. e.*, the number of c.c. of $n/5$ solution of sodium hydroxid required to neutralize 10 c.c. of juice, with phenolphthalein as the indicator.²⁷ Ten c.c. of the juice and 40 c.c. of distilled water were used for each titration, when circumstances permitted.

Fruit and vegetable juices were obtained by the following method: The fresh mass was rinsed with distilled water and dried with a clean towel. Fruit like orange or lemon was cut, and the juice, expressed by hand, was strained through a

²⁶ Most of the data referred to in this section were obtained by Mr. E. G. Miller, Jr., in coöperative experiments under the senior author's direction. Miller: Dissertation (in partial fulfillment of the requirements for the degree of Ph.D.), Columbia University, 1913, p. 21; Biochemical Bulletin, 1913, ii. p. 555.

²⁷ Rosolic acid was also employed as a collateral indicator in most of the determinations, with results that were practically identical with those obtained with phenolphthalein. Litmus lacked delicacy at the neutral points in the titration of most of these media and therefore failed to yield reliable results.

piece of clean white China silk on a funnel, into a dry bottle (glass-stoppered). Less juicy masses, such as tubers, were cut into small pieces, macerated in a large porcelain mortar, and the juice expressed through dry washed muslin. When an insufficient quantity of juice was obtained, quantitative dilutions were made, and the equivalent for 10 c.c. was calculated from the titrations. The "banana juice" referred to in the appended summary, was really a thick cream of finely divided fruit substance which had been pressed through silk or muslin.

Throughout, all possible precautions were used to prevent the introduction of errors in determination. Titrations were made within a few minutes after the juice was available. When fruit was cut, a silver knife with a gold-plated blade, was used to avoid reaction with the fruit-acid. Rubber gloves covered the hands in all manipulations in which the skin, by coming in contact with the juices, might have contributed acid from the epidermal secretions. The standard solution of alkali was protected from contamination by atmospheric carbon dioxid and moisture, with two "U" tubes containing soda-lime. Evaporations were prevented by expediting all processes and keeping the juices in stoppered bottles.

In the cases of beet, cherry, cranberry, currant and strawberry, where the deep red color of the juice obscured the end-points of the titrations, neutrality was determined by diluting 10 c.c. of the juice with 400 c.c. of water before titrating, and carefully comparing the color at the end-point of the titration with that of a "control."

The numerical results in the appended summary are the average figures of concordant determinations made, in most cases, on at least three fruit specimens from different sources. The data are summarized in the sequence of increasing acidity (c.c. of $n/5$ acid solution per 10 c.c. of juice):

Cocoanut milk.....	0.4	Parsnip.....	2.1	Red cherry.....	7.6
Watermelon.....	0.6	Banana.....	2.6	White cherry.....	8.4
Turnip.....	0.6	Pear.....	3.2	Horseradish.....	9.2
Radish.....	0.6	Apple.....	3.5	Strawberry.....	9.3
Cantaloupe.....	0.6	Apricot.....	3.8	Grape fruit.....	10.3
Carrot.....	0.8	Tomato.....	4.2	Rhubarb.....	11.1
Celery.....	0.8	Grape.....	4.5	Gooseberry.....	16.2
Asparagus.....	0.9	Plum.....	4.8	Cranberry.....	19.6
Cucumber.....	1.0	Peach.....	6.4	Currant.....	20.4
Red beet.....	1.1	Orange.....	6.7	Vinegar (apple)....	26.1
Cauliflower.....	1.9	Pineapple.....	7.5	Lemon.....	53.7

An extension of this list will be made during the further progress of our work. The *nature of the acidity* in the most important cases will also be determined. With full information along these lines we shall be able to determine very accurately, and to your entire satisfaction, which medium is most suitable, and at what dilution, for application to the teeth—*i. e.*, which will be most effective in disorganizing mucin plaques, in destroying oral micro-organisms, in stimulating after-flows of saliva, and yet, which will have no destructive effect on the enamel or on the oral membranes. You see with us, we are sure, how futile it would be to conclude anything on these points, while so much remains to be learned about the *nature* of the acids and acid salts involved, and, especially, about the *specific* dental and oral effects of each of these substances individually.

4. ACTION OF ACETIC ACID, VINEGAR AND GRAPE-FRUIT JUICE ON ENAMEL, DENTIN, BONE, TRI-CALCIUM PHOSPHATE AND APATITE POWDERS, WITH SPECIAL REFERENCE TO COMPARATIVE RESISTANCE TO SOLUTION. Whatever may be said of food-acid media as mucin precipitants, bacteria destroyers and salivary stimulants, there remains the specter of possible insidious destructive action by such media on enamel if applied to the teeth systematically. "Does not the acid dissolve calcium from the enamel" is one of the many questions that spontaneously occur to every student of these problems. Would not repeated removals, if only of a trace each time, finally result in erosion, penetration, disintegration?

Although we believe that there is no more danger of damage to the teeth when fruit juices are intentionally applied to them than when such juices come in contact with the teeth as an incident to the ordinary ingestion of fruits, nevertheless it is desirable to ignore all opinions and to determine the facts in careful observations. Our experiments in this connection are in progress, but we are glad to present in this and the two succeeding sections of this report, the preliminary findings of most significance.

The best way to determine the maximum degree of solubility of a given material in a certain medium at a stated tem-

perature is to expose an excess of the former, *in its finest state of division*, to a definite volume of the latter in a high degree of agitation for a prolonged period. For the determination of *comparative* solubilities it is sufficient to maintain standard conditions in approximation to the most favorable ones. We studied at first, in this connection, the comparative solubilities of enamel, dentin, bone, tri-calcium phosphate and apatite under conditions intentionally rendered favorable to an exhibition of the highest degree of solvency.

We prepared powders of these materials as follows: *Enamel* was chipped from teeth or broken off by gentle hammering, the pieces were crushed and pulverized, first in a porcelain mortar, then in an agate one, and finally were sieved through white China silk so that an impalpable powder was separated. *Dentin* was obtained as saw-dust by sawing through clean roots of teeth and pulverizing the saw-dust in a porcelain mortar. Steel particles from the saw were present in the dust, but were removed, before pulverization, with a strong magnet. The dentin saw-dust was finely ground in a mortar and sieved through silk. *Bone* powder was obtained by the sawing method; but, as bone is much softer than dentin, the dust was not contaminated by steel particles from the saw. Commercial *apatite* and *tri-calcium phosphate* were pulverized in porcelain and agate mortars, and sieved through China silk. The powders were dried to *constant weight* at 105 degrees C.

The acidity of the *vinegar* employed as a solvent (1 part vinegar and 1 part water), per 5 c.c., was equal to that of 6.9 c.c. of *n/5* acid solution (as determined with *n/5* sodium hydroxid solution and phenolphthalein); of the *grape-fruit juice*, it was equal to 5.5 c.c. The acidity of the acetic acid was made equal, by dilution, to the acidity of the diluted vinegar. The latter contained 1.8 mg. of calcium (expressed as CaO) per 50 c.c.; the grape-fruit juice contained 5.7 mg. of calcium (expressed as CaO). The acetic acid solution was free from calcium. Fifty c.c. of acid solution were added to exactly 100 mg. of powder in a small beaker, and extraction continued for 24 hours, with occasional stirring.

In all cases the bone, dentin, enamel and calcium phosphate powders rapidly dissolved. At the end of the period (24 hours), the calcium was completely precipitated with ammonium oxalate and the oxalate titrated in sulfuric acid solution with $n/20$ solution of potassium permanganate.²⁸ The analytic data pertaining to the quantities of dissolved calcium are appended:

CALCAREOUS MATERIAL		SOLVENTS	
<i>Powder</i>	<i>Acetic acid</i>	<i>Vinegar</i>	<i>Grape-fruit juice</i>
	CaO	CaO	CaO
	mg.	mg.	mg.
Apatite.....	3.8	3.0	1.3
Tricalcium phosphate.....	40.0	38.8	37.9
Bone.....	37.2	36.5	36.3
Dentin.....	37.0	36.7	36.1
Enamel.....	47.3	42.8	47.5

Under the conditions of these tests, the inorganic constituents of pulverized bone, dentin, enamel and calcium phosphate were almost entirely dissolved in each case. Enamel yielded the most calcium to solution, apparently for the reason that it contains a larger proportion of calcium than each of the other three materials named with it, just as it contains relatively less organic matter than bone and dentin.²⁹ The apatite powder was almost insoluble and yielded very little calcium to the solvents. It was evidently more resistant than the enamel to the action of acid.

We included apatite in these experiments, and others described in this report, because of the probability that the calcium, phosphorus, oxygen and carbon in the mineral part of bone and teeth exist in these structures in chemical relationships analogous to those of calcium, phosphorus, oxygen and fluorin (or chlorin, or hydroxyl) in apatite.³⁰ The appended

²⁸ McCrudden: *Journal of Biological Chemistry*, 1911, x., p. 187.

²⁹ We are not inclined to emphasize this observation before we obtain additional data. We are not certain that the enamel employed was free from defective portions, since some of the material was obtained from the edges of carious imperfections; then, too, the differences among the figures are within the limits of unavoidable analytic error under the conditions of these particular experiments. This special matter will be investigated further with enamel from perfect teeth.

³⁰ Hoppe-Seyler: *Archiv für pathologische Anatomie*, 1862, xxiv., p. 13.

5. ACTION OF VINEGAR ON NATURAL, EXTRACTED TEETH, WITH SPECIAL REFERENCE TO THE QUANTITATIVE REMOVAL OF CALCIUM DURING REPEATED IMMERSIONS FOR STATED PERIODS (WITH DEMONSTRATION OF SPECIMENS). Our second series of tests of the solvent action of food-acid media on enamel was applied to natural, extracted teeth immersed in the selected acid solutions for periods of definite lengths under standard conditions. We aimed especially to view our data pertaining to enamel, as recorded in the preceding section of this report, in the light of results by this method. This immersion process is also analogous to methods conventionally employed to demonstrate that "*all acid is bad for the teeth.*" We believed that the conventional findings, expressed in *mathematical terms*, would be particularly helpful in our purpose to show the fallacy in conclusions from results of such experiments, as well as in our effort to comprehend the import of the data from the experiments described in the succeeding section of this report.

When teeth are exposed to the action of dilute mineral or organic acid solutions, they are decalcified; the enamel loses its glaze, becomes chalky white; and, if the acid is abundant in amount and the immersion is continued long enough, disorganization occurs. All this is well known, but any statement of it is apt to create apprehension. (1) Do such gross observations teach anything about the effect of food-acid in the mouth under physiological conditions? (2) Does the rapid cremation of a human body imply that ordinary oxidation, heat production and temperature maintenance in a similar body are dangerous and, therefore, undesirable? (3) Would a hundred maximum medicinal doses of strychnin do as much harm, by regular successive medicinal administration to a given individual, as an *overdose* equal to one hundred medicinal doses? (4) If the combined power of five men of equal strength is required to raise a given weight, could one of the men raise the weight at his fifth effort by pulling on it at his maximum strength five times in succession? (5) Would a college yell of 1,000 voices at a football game make a noise like a riot if the 1,000 voices piped one after another? These

five foolish questions answer themselves. If it be suggested that we have ignored, in this series, such facts as the familiar one, that "water, dropping *day by day*, wears the hardest rock away," we can promptly answer by asking another question: What relations do the whole period of time involved, the entire volume of effective water and the total number of applications, in this process, bear *to the effect produced*; and what are the *real* implications for us in connection with the analogous effects of food-acids on enamel, when applied, as dentifrices, to the teeth?

Although enamel is rapidly dissolved and disintegrated by dilute vinegar and fruit juices, the effect of such acid media on teeth, when the latter are immersed for short periods of time, may be very slight. Teeth, which were free from caries, were embedded in square blocks of paraffin in such a way that the roots were entirely covered and only the perfect enamel exposed. Three teeth, thus embedded, and exposing 0.75 square inch of surface, were placed in vinegar (diluted with an equal volume of water) for successive periods of 5 or 10 minutes in length, during which the liquid was *stirred constantly*. We obtained the results in the accompanying summary:

IMMERSION		CALCIUM	IMMERSION		CALCIUM
Sequence Minutes		EXTRACTED, <i>Expressed as</i> <i>mg. CaO</i>	Sequence Minutes		EXTRACTED <i>Expressed as</i> <i>mg. CaO</i>
1	5	0.0	8	10	0.68
2	5	0.0	9	5	0.70
3	10	0.28	10	10	1.20
4	10	0.22	11	5	0.70
5	5	0.28	12	10	0.98
6	10	0.70	13	5	0.84
7	5	0.56	14	10	1.54
Total.....				105	8.98

Two of the three teeth employed in these tests were imperfect. In one molar there was a very obvious general fracture through the enamel, which extended from the lower edges of the enamel on two sides, across the top. In the second, a piece of enamel about 1/32 of an inch square had been chipped from the enamel on the side, near the top. These three teeth were the best available at the time it was necessary for us to

proceed with these particular experiments. We felt that, although these teeth might be more susceptible, because of these defects, to the solvent action of vinegar, the defects would induce *plus* errors, if any—errors that would work *against* our convictions rather than for them.

It may be seen, from the data in this summary, that the total amount of calcium extracted from three teeth, having a total of 0.75 square inch of exposed surface, was (expressed as the oxide) 8.98 mg. in $1\frac{3}{4}$ hours, or 105 minutes. This period of time is 420 times a period of 15 seconds, which would probably be the *maximum* time during which the individual teeth might be in contact with acid, if such diluted vinegar were used as a dentifrice. Furthermore, since there is not a close analogy between the conditions obtaining in a beaker and those in the mouth, where food-acid stimulates the flow of alkaline saliva, which washes away the acid rapidly and also quickly neutralizes it, the solvent action would presumably be very much less. Under normal conditions, then, is it probable that as much calcium would be removed from perfect enamel surfaces of equal extent *in a whole year of two brushings of the teeth daily with such diluted vinegar?* But such vinegar, diluted half and half with water, has nearly the *maximum* acidity of dietary mixtures, and certainly is equal to the maximum dietary acidity in vigor of attacking power. The *practical* dangers of this treatment appear visionary, therefore, even when we assume that the enamel derives nothing from the oral secretions to *repair* any such slight direct damage as that noted above. But what of such dangers if enamel *does* derive such (reparative?, protective?, defensive?) material from the oral environment? (See page 306.)

A piece of enamel, having a surface exposure of $\frac{1}{16}$ square inch, weighed 135 mg. The exposed enamel on the three teeth used in the foregoing experiment weighed approximately 1620 mg. $\left(\frac{0.75}{0.0625} = 12 \times 135\right)$. The amount of calcium that was cumulatively dissolved in a total period of 105 minutes, under the artificial conditions described above, was very slight compared with the total weight of enamel involved—*only 0.55 per cent.!*

Experiments were also made with different strengths of vinegar, in which teeth were immersed for five-minute periods, with these results:

IMMERSION Sequence	DILU- TION	CALCIUM EXTRACTED, IMMERSION		DILU- TION	CALCIUM EXTRACTED
		Expressed as mg. CaO	Sequence		Expressed as mg. CaO
1	1:1	0.91	5	1:1	1.26
2	1:3	0.98	6	1:3	1.05
3	1:1	0.70	7	1:3	0.95
4	1:3	0.98	8	1:3	1.12

These teeth had been used in all the preceding experiments of this kind. By this time they appeared to be more susceptible to the action of the vinegar than they were at the beginning.

Three sound teeth (surface exposure, 0.66 square inch) which had not been used in any other experiment, were immersed for 1 hour in vinegar *diluted with 9 parts of water*. During three immersions, 1.0, 1.25, and 1.46 mg. of calcium (expressed as CaO) were successively extracted.

Three sound teeth which were continuously exposed for five days to the action of vinegar *diluted with 127 parts of water*, were perceptibly whitened and etched, by the end of that period. (See page 299.)

Under the artificial conditions of all these experiments, the teeth lost their gloss and the acid exerted cumulative action in extracting increasing amounts of calcium with the successive immersions.

It is obvious from these data, further, that mere removal of glaze from the enamel, in such experiments, does not *necessarily* imply an *important* effect on the enamel itself.

We have also observed, incidentally, that by merely rubbing, with the palm of the hand, the lack-luster enamel surfaces resulting from these treatments, the gloss was restored, presumably from introduction of traces of epidermal lipins. Are there traces of lipins from the oral environment, in enamel ordinarily, to account for some of the normal gloss? The persistence of the normal glaze after washing enamel with soap implies the contrary. Possibly the loss of luster in these

continuous experiments was due to other effects than the mere removal of the traces of calcium compound from the enamel.

6. ACTION OF VINEGAR, APPLIED TWICE DAILY AS A DENTIFRICE, FOR FOUR MONTHS, ON SOUND, ALSO VARIOUSLY FILLED, NATURAL, EXTRACTED TEETH (WITH DEMONSTRATIONS OF METHODS AND SPECIMENS). The most effective test of the possibility that food-acid media, when used as dentifrices, would exert destructive action on the enamel is obviously the test applied directly to teeth in their natural environment.

The senior author has been using vinegar in various degrees of dilution, as a dentifrice twice daily, for several years, and his teeth have never appeared, in his own estimation, to be in better condition than they are now; certainly, the vinegar has done no discernible damage. These convictions are supported by the more critical opinions of the dentist who has frequently examined his teeth during the past few years. The members of the senior author's family, including three sons ranging in age (now) from $4\frac{1}{2}$ to 11 years, have been equally industrious in the cheerful application to their teeth of diluted vinegar (1 part of vinegar and 2 parts of water) with similarly gratifying results. Further experience in this family, and by other individuals, will be reported by us as attention to this practical phase of the subject increases. We hope that many dentists will also interest themselves, practically, in similar tests of the matter.

Besides such studies of teeth under *natural* influences, it is clear that analogous tests of the action of food-acid media, when applied to natural *extracted* teeth under conditions approximating those of the oral environment, would afford results of almost equal significance. We have been testing this matter in a very direct and interesting way, daily for four months; and, although these particular experiments are in progress and will be extended, the data at hand are both instructive and important—and bear out fully our interpretation of a minor significance for the results on solvent action that were reported in sections 4 and 5 preceding, as well as for all similar data recorded by others.

In this phase of our work we have raised, and attempted

to answer, this additional question: *What is the effect of food-acid on the enamel at the edges of filled cavities, and on fillings themselves, particularly at the edges?* It is conceivable that food-acid, if not particularly destructive of normal enamel, might be strongly disintegrative of enamel along the line of contact with filling materials such as amalgam. Electrolytic changes might be supposed to occur to an appreciable extent on both sides of the dividing line—changes, it might be inferred, which would undermine the fillings involved, if nothing more generally harmful were accomplished.³¹

For thorough tests of these points, we used teeth of different sizes, shapes and conditions. A few of the teeth were sound, most of them contained typical fillings—*i. e.*, gutta percha, silicate cement, oxy-phosphate of zinc, synthetic porcelain, red copper cement, alloy, amalgam, cast gold inlay, malleted gold. The teeth were obtained for us by Dr. J. Morgan Howe and Dr. C. C. Linton. Before the test was begun, Dr. Arthur H. Merritt made a critical examination of one group of the teeth, with special reference to the detection by him, subsequently, of any unfavorable change whatever as a result of our intended treatment of the teeth. Dr. Linton did the same with the second group involved. We are greatly indebted to Drs. Howe, Linton and Merritt for their cordial co-operation, and await with interest the report they will make later this evening on the condition of these teeth. We do not know what their findings have been.

In order to approximate that condition of an oral environment which appears to be most essential and significant in such a test as this, *i. e.*, continuous presence of *saliva* on the tooth surfaces, we proceeded as follows in our treatment of the teeth that had been selected for this experiment: The teeth were embedded in blocks of paraffin about $\frac{3}{4}$ of an inch square, in such a way as to completely cover the roots with the paraffin, leaving only the enamel surfaces with the fillings exposed. These blocks, containing the teeth, were then placed in a narrow zinc box about 8 inches long and 1 inch deep, in

³¹ The effect of dentifrices on *filled* teeth deserves much more attention than it has received, and we hope to conclude this phase of our study with extended observations of the influence of certain approved alkalin media.

such a way that the lower edges of the exposed surfaces were on a line with the edges of the box. The box was then completely filled with melted paraffin which, after hardening, made an "artificial jaw" in which the teeth were firmly fixed. The box was covered with a thin layer of paraffin to prevent corrosive action on the metal during the subsequent treatment.

An ordinary flat toothbrush with tufted bristles was used for the application of the dentifrices. At each application the brush was held a moment in running water, the bulk of the suspended water dislodged with a jerk, and then ten drops of diluted vinegar (1:1) or of a popular, slightly alkaline, antiseptic dentifrice were allowed to fall on the wet brush from a dropping bottle. The teeth were vigorously and systematically brushed for a period of 10 to 15 seconds. The brush was then rinsed in running water, and the teeth washed with the water that was suspended in the brush. The excess of water on the teeth ran over the sides of the "artificial jaw." The teeth were washed with three fresh supplies of water in the brush. Finally, residual water was drained from the teeth by simply tilting the box. Saliva was then expectorated on the teeth and distributed over them with the clean brush. During the intervals between brushings (which occurred daily, morning and afternoon) each box of teeth was kept in a moist chamber, for which purpose the senior author's glass device for the preservation of hashed meat by the cold storage method was employed, with exceptional advantage.³² A small amount of water was kept on the bottom of the chamber and the "artificial jaw" was supported at a level therein, on flat pieces of cork. By maintaining closure with the glass lid, the atmosphere in the chamber above the teeth was kept saturated with water, and the saliva on and around the teeth was prevented from evaporating. The conditions for bacterial activity were especially favorable because of the stagnation of the fluid.

The conditions of these experiments were such as to

³² Gies: *Proceedings of the Society for Experimental Biology and Medicine*, 1908, vi., p. 27. The apparatus referred to consists of a rectangular heavy-glass box, with an adjustable glass lid—in effect, a tall, rectangular bottle open at one broad side instead of at the top, and resting on the opposite side.

favor (a) the *maximum* destructive effect, if any, of the liquids used as dentifrices, and (b) the *minimum* protective influence of the saliva. The normal conditions in the mouth, it seems to us, would permit less destructive activity by the acid (if there was any at all), and would possess greater protective potential.

Various modifications of these experiments will be studied in detail before we present our next report.

The two sets of teeth, in their moist chambers, together with brushes and dropping bottles employed, were exhibited and passed to the members in attendance. The speaker stated that the set of seven teeth, with a hexagonal apatite crystal at each end of the row, was treated twice daily since June 6 (*four months*) with vinegar, diluted half and half with water, and that Dr. Merritt's report would refer to that particular group. The second set of nine teeth, which were under Dr. Linton's observation, had been subjected to simultaneous treatment with a popular, slightly alkaline, antiseptic dentifrice, beginning about a month later (*three months*). The statements by Drs. Merritt and Linton on the results of the treatments appear on pp. 363-5 of the general discussion of this report.

7. DOES ENAMEL NORMALLY ABSORB FROM SALIVA ANY SUBSTANCE THAT AFFECTS ITS QUALITY? That the oral secretions protect the teeth *mechanically* by their flushing effect on the dental surfaces may be taken for granted as a fair inference from both the quality and quantity of the secretions. That the saliva protects the teeth *chemically* is also a deduction to which doubtless all of us subscribe, but we are very uncertain about the minutiae of such protection—in fact, full determination of the details of such conceded protection is now one of the urgent demands of dental science.

In raising the question at the head of this section, we aim not so much to discuss, at this time, the indicated problem as to point out several significant possibilities for your future attention and our own investigation.

It appears to be generally believed that earthy phosphate may pass from the saliva into the enamel and, by precipita-

tion or fixation, increase the hardness of the latter. It seems certain that a transmission of such phosphate occurs to a considerable degree for some time after the eruption of the teeth. It is probable that absorption (retention) of precipitable, *i. e.*, functional, phosphate occurs at any time that certain common physical and chemical conditions favor such changes.

Permit us to quote, in this connection, a few significant remarks from a recent paper by Head on the possible absorption (retention) by enamel of something from saliva that re-hardens the enamel after it has been softened (decalcification) by acid—observations of particular interest and significance in any consideration of the resistance of teeth to the action of food-acid media:

“The action of water solutions of acid calcium phosphate and acid sodium phosphate on the teeth has been mentioned by Kirk, stress being laid on the fact that these salts cause smooth white decalcification. As a matter of fact, many acids in water solutions cause smooth primary softening, if the solution is sufficiently weak. Saliva ordinarily restrains the action of most acids up to a certain point, and then begins with the smooth decalcification and ends with the same rough white decalcification that we find in a water solution. The saliva solution is ordinarily from ten to twenty times weaker in its action on enamel than is a water solution of the same acid strength. The acid sodium phosphate and acid calcium phosphate are, however, intensely interesting in their action, not only in water solutions, but in saliva solutions. Acid calcium phosphate 1 to 5,000 water solution, and acid sodium phosphate 1 to 20,000 water solution at the end of two days, will turn tooth enamel into a cloudy, pearly white, with a clear smooth surface. This surface is distinctly softened to the cut of a lancet. If, however, these teeth are removed from the solutions before the process advances too far, the cloudy appearance will in time disappear, and the tooth enamel will resume its normal appearance. This phenomenon occurred many times, but once when I retested the hardness of these teeth with a lancet I found that not only had the white color disappeared, but the superficial softening of the enamel had disappeared also. At first I attributed this disappearance of the softening of the enamel to previous faulty observations, but the same phenomenon occurred in my lactic acid test. A tooth that had been placed in a 1 to 20,000 lactic acid watery solution, at the end of a few days was slightly softened to the cut of the lancet, but a month or so later the lancet would not cut it. It was then that the possibility was made apparent that partially softened smooth enamel could rehardens itself if the decalcification had not progressed too far.

“I then made the following test: Two sound teeth with enamel impervious to the lancet were each placed in a lobe of a navel orange. These

lobes were each placed in a bottle with a few drops of ether to prevent fermentation, and kept at body temperature for two days. At the end of that time the teeth were removed and examined. The lobe around one of the teeth had fermented, the lobe around the other had not. The tooth in the fermented lobe showed a smooth, white, translucent area of decalcification, running from the cutting edge to about one-third of the distance to the neck. The rest of the enamel was normal to all appearances, and yet the surface, both of the white and the apparently normal enamel, was readily pared with a lancet. The lobe in which the other tooth was embedded had not fermented, and the enamel also seemed normal, but here again the outer surface of the tooth enamel was distinctly softened. These teeth were then washed in water and kept in some of my saliva at body temperature for two weeks. At the end of five days there was a decided rehardening of the enamel surface, and the white area of decalcification on the tooth mentioned had half disappeared. At the end of ten days the enamel could no longer be scratched with a lancet; at the end of two weeks the white spot of decalcification had almost if not entirely disappeared, and both teeth appeared perfectly normal.³³

With the aid of a highly developed and apparently very accurate machine to "show in the minutest degree just how far a given force would drive a standard punch into sound enamel, partly decalcified enamel and rehardened enamel, if it did reharden, from the effects of slight decalcification," Head made many observations confirmatory of the general proposition quoted above.

"Take, for example," he says (page 2120), "the test that was made on a specimen of tooth enamel that I use for an illustration. One side was ground to a flat, broad base, on the other side the enamel was ground in a small corresponding parallel plane. This was placed on the anvil of the machine and raised up against an iridium point 1/50 of an inch in diameter until a pressure of 5 pounds was reached. A reading was then taken on the micrometer scale and noted. The anvil was raised up and down repeatedly until all give between the specimen and anvil disappeared, and the 5 pounds pressure always gave the same reading. Then fresh lemon juice and water 1 to 100 was placed on the specimen around the point and the point relaxed so that the fluid could readily get underneath. At certain intervals of time the pressure of 5 pounds was tried and a reading taken which showed a loss of tooth structure as follows:

2 minutes	0.8 micron
5 "	1.2 "
10 "	1.4 "
35 "	2.3 "
60 "	2.8 "

³³ Head: *Journal of the American Medical Association*, 1912, lix., p. 2118.

"Thus, in one hour there was a loss of 2.8 microns of tooth enamel. This same test was then made on the same tooth enamel with a fresh saliva solution of lemon juice, 1 to 100. This solution turned litmus red and was distinctly sour, and yet after an hour's application the enamel showed a loss of only 0.3 of a micron. We might, therefore, express the restraining factor of that saliva as 28:3 or 9. Numerous other tests have been made of a similar nature and all seem to give consistent figures. They almost invariably seem to prove the power of saliva to restrain the action of lemon juice on enamel. They also show that some enamels are much more resistant to decalcifying action than others.

The "power of saliva to restrain the action of lemon juice on enamel," in some of the foregoing experiments, may be ascribed to mere reduction in the degree of free acidity of the diluted lemon juice, both the mineral bases and the proteins of the saliva used for that dilution combining with some of the acid of the lemon juice to reduce the active acidity of the liquid. This criticism does not apply, however, to the data in the last paragraph of the first quotation above, from Head's paper, nor to the main observations recorded in the following statement by Head (page 2120):

"As an illustration, another test might prove interesting: This specimen was ground longitudinally for a base along its axis and a small parallel plane ground on the enamel of the opposite side. A solution of 1 to 100 lemon juice and water applied for an hour dissolved 1.0 micron. Saliva and lemon juice, 1 to 100, applied for sixteen hours showed no loss of tooth tissue at all. It was then tested with the steel punch 1/50 of an inch for density and was found so softened that from 60 pounds to 70 pounds pressure could not be obtained. The softened enamel simply refused to support the punch under such a pressure. The specimen was then placed in fresh saliva and set in the culture oven at blood heat for seven hours, the saliva being changed every half hour. At the end of that time the tooth was again tested with the steel punch and was found to have so hardened that 75 pounds pressure was readily withstood and a various penetration noted of 3.5, 2.8, 3.2, 4.5 microns. No doubt it would have hardened up more, but the various testings had so strained the specimen that it was considered advisable to continue with others."

At another place in the same paper (p. 2121) Head says: "This softening and hardening of enamel has a very practical bearing in relation to mouth cleansing and the use of brush and dentifrices. Enamel that in its hardest state would only show insignificant wear to dentifrice grit and friction in a temporarily softened state may, through a good brushing with grit, lose a very material amount of tooth structure. This softening and hardening may readily account for the reason why some patients, especially those fond of fruit, wear their teeth down to the gum, at a

comparatively early age. The mere friction of mastication is sufficient to take off a layer of enamel softened by fruit or vinegar, which if left to itself might reharden."

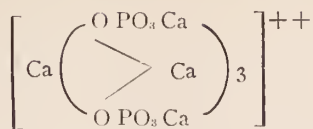
The results of our study of the effect of vinegar, used as a dentifrice, on teeth embedded in paraffin and kept moist with saliva (pages 303 and 363) do not support the latter opinions; although, of course, our period of observation (six months to date) was comparatively short. But, if this general opinion of Head's is correct, careful determinations of the *nature* of the most suitable acid substance in, and the optimum degree of acidity for, the best acid dentifrice, are quite as important and desirable as we have already suggested (pages 293 and 295).

In concluding his remarks, Head said (p. 2122): "I cannot explain how these things occur, because I do not know. I am simply in a maze of astonishment. I am convinced that enamel will harden and soften. Since this has come to my attention, I have noticed spots that apparently seem to disappear, and I have had other dentists make the same observations. If that spot disappears, would not this prove that the enamel is not the dead, inert substance that we are supposed to consider it? I cannot help feeling that the enamel is undergoing a series of changes, a sort of unseen action in itself, and that it is capable in its own molecular being of softening and hardening, something similar to the Bermuda rock which hardens under certain conditions. It is nothing unusual for crystals to harden and soften again."

At two of your former meetings' similar views on the changeableness of enamel were urged.³⁴

8. DOES ENAMEL NORMALLY UNDERGO ANY CHANGE, BY SUBSTITUTION, THAT INCREASES ITS HARDNESS OR ITS RESISTANCE TO THE ACTION OF ACID? We have already alluded to the similarity between the chemical constitutions of typical apatite and the bulk of the inorganic matter in enamel, dentin and bone (page 297). We have also noted that the difference between the two constitutions may be expressed by the statement that the enamel (dentin, bone) compound is a carbonate, whereas apatite is a fluorid (or chlorid or hydroxid) of a common *divalent radical*, whose chemical character is indicated by the accompanying formula:

³⁴ Gies: *Journal of the Allied Dental Societies*, 1912, vii., p. 214.



A great difference, in solubility in dilute acids, between enamel powder and apatite powder was shown in the tests described in Section 4 of this report. That observed physical dissimilarity was due primarily to the comparatively slight chemical difference referred to in the preceding paragraph.

Is it possible for chlorin, or fluorin, or hydroxyl, or all of these chemical units, to replace carbonate radicals in enamel under conditions that may prevail in the oral environment, and thus both harden enamel and increase its resistance to the action of acid? What are the chemical affinities of chlorin and fluorin in enamel, and where are these elements localized, if they are not uniformly distributed? These are questions that we cannot answer, but which suggest lines of inquiry we intend to pursue.

Recent experiments by Gassmann³⁵ make it evident that the bulk of the inorganic matter in teeth may be transformed from the carbonate (enamel) form to the chlorid (apatite) form by simple fusion with calcium chlorid. The resultant product can easily be freed from extraneous matter, in Gassmann's method, *by thorough washing with acetic acid*, in which, like apatite, the artificial derivative does not dissolve. Gassmann, it seems, was concerned only with the question whether the osseous and dental mineral matters are apatite-like in molecular coördination. To us his experimental results suggest the strong probability that substitutions such as he effected in establishing the main point in his inquiry (substitutions by which soluble carbonate becomes the relatively insoluble chlorid or fluorid or hydroxid) may occur in teeth under *physiological* conditions. (See our preliminary reference to this general matter on page 298, where formulas are also given.)

9. SUGGESTIONS AND DATA ON THE PROPHYLACTIC USE OF

³⁵ Gassmann: *Zeitschrift für physiologische Chemie*, 1913, lxxxiii., p. 403.

FOOD-ACID WERE MADE BY WALLACE PRIOR TO OUR OWN AND PICKERILL'S PROPOSALS ON THIS SUBJECT.—A year ago the senior author,³⁶ in discussing here "Some recent developments in the study of dental caries," restricted his remarks to a consideration of "one of the most important and far-reaching of the recent studies of dental caries—the book of Dr. H. P. Pickerill, on 'The Prevention of Dental Caries and Oral Sepsis.'" It was the speaker's intention, by confining his remarks to Pickerill's work among others deserving of attention, to convey through this journal, to its many readers, the most interesting and important opinions and findings in Pickerill's impressive contribution to dental science. Special attention was given to Pickerill's views on the virtue of acid ingredients in the diet.

It was said that Pickerill "states conclusions which not only support the proposed use of fruit and vegetable juices, etc., as dentifrices, but which also indicate a larger usefulness of such 'natural acids' as essential elements in a *prophylactic diet*. Let me quote a few of his statements on this broad view of the utility of 'food acids' and acid dietaries in the contest against dental caries:

"In order to prevent the retention of fermentable carbohydrates on and between the teeth, and so eliminate or very considerably reduce the carbohydrate factor in the production of caries, *starches and sugars should on no account ever be eaten alone, but should in all cases either be combined with a substance having a distinctly acid taste, or they should be followed by such substances as have been shown to have an "alkaline potential;"* and the best of these are, undoubtedly, the natural organic acids found in fruits and vegetables.' (Page 215.)

"The diet of all "natural" races and of those *relatively immune* to caries . . . is characterized by *variety and sapidity*. . . . Further, it will have been noticed that, although a variety of *sapid* substances are used, yet the ones most frequently recurring are *acid in reaction, chiefly fruits and berries*; and, as has been previously shown, these are the very stimulants which produce the most profuse and the most alkaline flow of saliva, and to this latter I think we are justified in ascribing the relative immunity found in the races which have been considered.' (Pages 264-5.)

"We may, therefore, conclude that the dietary of civilized communities at the present time errs seriously in the direction of being too

³⁶ Gies: *Journal of the Allied Dental Societies*, 1912, vii., p. 397.

soft, of having too high an acid potential, of being not sufficiently stimulating to the salivary glands and not sufficiently detergent.' (Page 276.)

"It has been shown that by the combination of strong salivary stimulants with such substances, either in a mixture or, much better, in sequence, the acid production may be reduced to a minimum or entirely negatived. What is therefore to be advocated is that *all meals should contain a far greater proportion of salivary excitants, and, more important still, should both commence and end with some article of diet having an acid reaction.* This does not of necessity imply a "vegetarian" diet; in fact, many "vegetarian" meals are distinctly conducive to caries on account of their soft, pappy, and adhesive nature.' (Page 276.)

"Taken in such a manner, the total amount of fruit and vegetable need not be large, and in no case should such a dietary be commenced suddenly; it should, especially in those who have been unaccustomed to the inclusion of fruit and salad in their dietary, be worked up to gradually, commencing with one meal a day, then, after a week or two, two meals may be terminated with "acids," and finally the principle may be extended to all meals. Should any intestinal irritation be set up, the inclusion of boiled milk in the dietary will correct it; this I have found to be but very occasionally necessary, and only in the initial stages. The much-dreaded bugbear "diarrhea" is much more likely to be caused by eating fruit in an unclean condition than to be due to the mechanical or chemical action of the fruit on the bowels. All fruit, therefore, especially that of unknown source, should be well washed or have the skin removed before being eaten. The only effect of fruit taken regularly and in such moderate quantities is to insure a full and regular action of the bowels.' (Page 278.)

"Much that is said in the foregoing *quotations* is based on the well-known stimulating power of weakly acid media to excite salivary secretion. Much that Pickerill has stated reiterates what I have said here, speaking under your auspices, on former occasions formally and informally. Much that Pickerill proposes, as formulated in these quotations, is new, but very suggestive and probably highly important. I earnestly suggest that dentists open their minds to possibilities of the proposed 'food-acid' prophylaxis (if prejudice or tradition has closed them), and that effective clinical tests of the value of the proposed measures be instituted in as many quarters and by as many dentists as possible." (Page 407.)

When these concluding remarks were made by the speaker, he did not know that the quoted conclusions in Pickerill's book had previously been stated, in substance, by Wal-

lace. It is a pleasure now, speaking from the same platform to many who were in the audience that heard the reading of these quotations a year ago, to do full though belated justice to the work and wisdom of Wallace.³⁷

From a group of seven available books by J. Sim Wallace, M.D., D.Sc., L.D.S., issued during the period 1902-1912, inclusive, we note the following typical statements in "Supplementary Essays on the Cause and Prevention of Dental Caries," published by Baillière, Tindall and Cox, London, in 1906.³⁸

"The next point that I would draw attention to is the *arrangement of the menu*. Cookery is an art by which man has been able to bring to his use multitudes of foodstuffs, which without its aid he was debarred from enjoying, but although it has been one of the most important triumphs that man has made, it does not necessarily follow that it is an unmitigated blessing. Cooking not only softens food, but it makes the carbohydrates more fermentable and more likely to lodge in the mouth. Now, it is not my intention to advocate a return to primitive foods and an abandonment of cooking. It is my intention only to show how the disadvantages which are associated with our modern methods of preparing and cooking foods may be overcome in the simplest, most efficacious, most pleasant, and most physiological manner. It simply amounts to this: *the last item in the menu should be dessert, not sweets*. This is physiologically correct, whether we are concerned with oral or stomachic digestion. Uncooked fruit in the routine dietary should be looked on as a *sine qua non*—at least, in the *last meal of the day*. The amount of fruit indulged in should be regulated by the amount necessary to keep the whole alimentary canal in physiological activity without the aid of medicine. It is an interesting fact that mothers who have a conscientious objection to giving medicine, and whose chief concern seems to be the lower end of the alimentary canal, have children who, as far as my experience goes, have teeth which are remarkably free from caries. I need hardly say that some fruits are better than others for keeping the mouth clean. The best is, I believe, the apple. *I have been struck with the freedom from caries of those who generally eat an apple after dinner*, and a few days ago I heard that a patient's relative of ninety had thirty-two sound teeth, who claims

³⁷ Pickerill has ignored Wallace almost completely. The only reference to Wallace on these subjects that we have found in Pickerill's above-mentioned book is the following: "The elimination of all fibrous elements from food, too, probably tends, as Wallace (*The Physiology of Mastication*, London, 1903) has pointed out, to the increased lodgability of food stuffs, by robbing them of their detergent action upon the teeth." (Page 269.)

³⁸ This was three years after the publication, by Wallace, of the work to which Pickerill referred, as quoted in the preceding foot note, and six years before the publication of Pickerill's book. The above named publishers also issued Pickerill's book (1912) and others of Wallace's books up to and including 1912.

to have always eaten apples, and moreover, *attributes his good teeth to this practice.* (Page 76.)

"There appears to be an idea that foods which are acid in themselves are harmful to the teeth; but *clinical evidence does not support this assumption.* When foods which are acid are taken into the mouth they *stimulate a flow of alkaline saliva*, not only while they are in the mouth, but probably *even after they are swallowed.* This is analogous to the fact that chronic hyperchlorhydria is associated with marked alkalinity of the saliva. Moreover, *acids are inimical to the acid-forming micro-organisms*, and it is just possible (!) that *the acid of acid foods tends to precipitate the mucus on those parts of the teeth which are not subjected to friction, and thus tends to protect those parts of the teeth.* (Page 77.)

If, by the concluding expression in the last paragraph ("it is *just possible* that the acid of acid foods tends to precipitate the mucus on those parts of the teeth *which are not subjected to friction*"), Wallace means a *chemical* precipitation of any mucin that *may happen to be on* the surfaces of the parts of the teeth which are not subjected, *physiologically*, to friction, and that the mucin is thus curdled by the acid and thereby rendered easily *removable* from such parts of the teeth, without their being subjected to physiological friction—if this is Wallace's meaning, then this quotation presents an *anticipation of the speaker's suggestion, four years ago, that food-acid media might prove to be useful dentifrices*—and for the identical reason. It is a personal pleasure to make this acknowledgment and a matter of regret to him that his *ignorance of the literature in this new field prevented the publication of this statement at an earlier date.* If, on the other hand (the quoted expression not being perfectly clear), Wallace means, in this particular quoted remark, to refer to a precipitation of mucin *from saliva upon* "those parts of the teeth which are not subjected to friction," and to suggest that such curdled, deposited mucin masses would, *as coverings or coatings*, "protect" (!) the parts of the teeth referred to—if that is Wallace's meaning, then there is no agreement whatever between his views and our own on this phase of the subject; in fact, his view and ours would be diametrically opposed to each other in this particular connection. We prefer to make the first interpretation our choice of the two alternatives, on

the ground that we wish to give Wallace the benefit of every doubt in the matter.

Continuing our quotations from the book of Wallace's already referred to, we note the following among other paragraphs of special interest in their relation to Pickerill's subsequent comment:

"If in recent years medical men have been able to inflict a restricted, *soft, alkaline, insipid, unphysiological, and even repulsive diet* on the vast majority of children, is it not possible that they will in the future be able (with the aid and advice of the dentist) to impose a less restricted, less pappy, less insipid, and in general a less disagreeable diet on future generations? (Page 78.)

"It is not my desire to enter into argument with regard to the inflictions and restrictions which have brought about the frightful state of the teeth which we know of to-day. I want only to indicate that the natural and beneficent desires and instincts will rather help than hinder the prevention of decay in the teeth, *i.e.*, of course, if the desires, instincts, and anatomy of the child are not perverted or ruined in childhood. This is my reply to those who admit that I may be correct, but doubt if people would relish and adopt the proposed reform. It is suggested that the experiment should be tried on the *corpus velle* before the theory can be proved. This I have done, and the teeth are, at the age of five, absolutely free from all suspicion of caries,³⁹ and this in spite of the fact that, hereditarily, the child under consideration would have been expected to have had remarkably bad teeth, and, further, in spite of the fact that he was a bottle-fed baby. Moreover, the tooth-brush and antiseptic mouth-washes were not used, except occasionally after partaking of food at the houses of friends. Yet, though considerably worn, his teeth are, and always have been, as white and clean as could possibly be desired; the darkest, the upper incisors, being B 1 of Ash's shades. (Page 79.)

"Further proof is surely forthcoming, for the theory is now believed by many to be *in accord with common-sense and clinical experience*, and it is impossible to prevent intelligent dentists as parents from adopting the same simple precautions for the benefit of those who are nearest and dearest to them." (Page 80.)

At this point the speaker said that this field was wholly unfamiliar to him when he began these researches four years ago, which accounted for much of the ignorance he had already revealed in these annual reports. But, just as his continuous effort to digest the literature led to his acquaintance

³⁹ "In a recent careful investigation into the state of school-children's teeth at that age, not one was found to have a perfect dentition; in the 95 children examined, 896 carious teeth were found." (*British Dental Journal*, November 15, 1905.) [Quoted foot note.]

with Pickerill's monumental work, and to his formal public statements in praise and appreciation of it, so the same endeavor brought to his attention the valuable contributions of Wallace. His dependence upon Pickerill's book, as a reliable survey of the field it covered, had unfortunately delayed his discovery of Wallace's views, and had thus prevented him from gaining, at an earlier date, the advantages recently derived from a study of Wallace's findings. He said he could not understand why Pickerill ignored the existence of such remarks by Wallace as those quoted above, which were largely a prestatement of important ideas in Pickerill's book that are presented there with the appearance of being original views; but he was obliged to assume that Pickerill, like himself, was unaware of their publication or else that Pickerill felt it undesirable to refer to them. If there was a good reason for the latter decision, the speaker felt it would be a public service if Pickerill would state them. But a contribution by Pickerill, in the number of this journal which was issued a few days ago,⁴⁰ and entitled "Knowledge and Belief," was not reassuring on this point.

Pickerill began that paper with the following puzzling statement:

"In recent papers in this JOURNAL bearing on the subject of the prevention of caries, the question of 'priority' has been mentioned. I regret very much that this should have been so, and I have no intention of entering into a discussion on the question. The work we are engaged in is far too important in its bearings upon the public health of civilized communities to be belittled by having any discussions of a personal nature ranging round it. The work with its results is everything; the man who happens to do it, merely the accidental instrument. It behooves every one interested in this national and world-wide problem to keep abreast of what is being done to help forward the work by criticism and suggestion rather (!) than to advance individual claims as to priority of publication.

"As regards the advocacy of natural organic acids, I should like to point out what really must be well known to every one—namely, that these substances have been known to act as sialogogues or salivary stimulants from time immemorial, the oldest of text-books on Material Medica will mention the fact."

⁴⁰ Pickerill: *Journal of the Allied Dental Societies*, 1913, viii., p. 226.

Many of the speaker's dental friends have good-naturedly asked him to consider his published allusions to Pickerill's work as the target at which this shot was fired, and he has accordingly accepted it with equal good humor as an intended "hit." There seems to be no other way out of it, in fact; yet, there is "something wrong somewhere," for how could the following statement, apparently the one "to advance individual claims to priority of publication," be misconstrued:

"It is interesting to observe that Dr. Pickerill is apparently unaware of the reports of your proceedings during the last three years. I have been wondering why no mention is made by him of some of the proposals which have anticipated his. Certainly not from any cheap desire to ignore the facts of dental history. *His book shows him to be too big a man for that.* I don't believe he ever heard of our work. His own studies have been conducted in far-off New Zealand. Our reports to you have been published in your JOURNAL OF THE ALLIED SOCIETIES. What in the name of dentistry are those 'allied societies?' Are they a brewers' confederation or allied trades organizations? Are the 'allied societies' a combination of social workers or amalgamated singing societies? What sort of an alliance does 'the journal' represent? I fancy most of your foreign colleagues in dentistry are wholly unaware of your proceedings, and unless your journal has been brought directly to their attention, know nothing about it. 'What's in a name!' In this case nothing—most emphatically and politely, nothing! Why not raise the banner of dentistry and put *Dental* into the title of the JOURNAL OF THE ALLIED SOCIETIES? You could then consider Pickerill, in the language of the 'funny men' in our newspapers, as the man who put the dent in a *fortunate* dental incident."^{40 a}

The speaker was also puzzled by the fact, he said, that after the report containing this quoted statement had been presented to Professor Pickerill, he wrote as follows to the editor of this journal:⁴¹

"Dear Sir: I was much interested in reading Dr. Gies' references to my work on 'The Prevention of Caries' in your JOURNAL for December, which you kindly sent me, and I wish to thank him for his kindly remarks. At the same time, I have no desire either to pose as a funny man or to be the innocent cause of your altering the title of your JOURNAL.

"I very much regret to say that Dr. Gies' inferences are correct: that I was not acquainted previously with either your JOURNAL or Dr. Gies' work. You must ascribe it to my being in 'far-off New Zealand. . . .'"

Regarding "individual claims as to priority of publica-

^{40 a} Gies: *Journal of the Allied Dental Societies*, 1912, vii., p. 40S.

⁴¹ Pickerill: *Ibid.*, 1913, viii., p. 190.

tion," the speaker went on to say, nothing had been done by him in any such connection to diminish in any practical degree his available time, or his inclination, "to help forward the work by criticism and suggestion," so that even if he did take a few seconds of his time a year ago to allude with humorous and friendly intent (as shown in the above quotation) to the *historical fact* that Pickerill's book appeared several years after the publication of the speaker's suggestion, the advance of dental science had surely not been *seriously* retarded by *its* loss of those few seconds from the speaker's devotion to it.

As to "claims of priority," the speaker proceeded to say, there was no occasion for peevishness, since there is no question of material priority to discuss. Pickerill has not suggested the use of food-acid media for the protective disorganization of mucin formations *on the teeth*, the speaker's special proposal. The nearest approach in Pickerill's book to such a suggestion appears to be the following in the section on "The Use of Dentifrices" (pages 226-233):

"We have already shown, too, how the addition of this salt (acid potassium tartrate) *to saliva* is beneficial in precipitating the mucin and in favoring dialysis. *Its addition to saliva* causes the latter to become watery and well adapted to flowing and percolating between the teeth and its fissures and grooves. . . . (Page 228.)

"Of course, other acids or acid salts may *possibly* be used in a similar manner. There are, however, two dangers to be guarded against—those of using an acid either too weak or too strong. If an acid be used in *too weak* a solution, it will certainly do much more harm than good, for it will reduce the alkalinity of the mouth without exciting any increased flow of saliva, and thus for some time the reaction of the mouth may be actually acid; or the weak acid, by being unneutralized too long, may in a stagnating cavity attack the enamel of the teeth itself. This is evidently why the lactic acid of fermentation is not neutralized—it is formed in such small quantities that the gustatory nerves are not stimulated. If an acid be used in *too strong* solution, it may have a precisely similar effect: the stimulus to the gustatory nerves will be too great; it will have a paralyzing effect, and the flow of saliva be consequently diminished, giving the opportunity to the stronger acid to directly attack the teeth." (Page 232.)

Even in these remarks Pickerill was thinking only, apparently, of the acid's stimulating effect on *salivary flow*, not

of any possible action of the acid on mucin *coverings* or *plaques* on the teeth.

"As regards the advocacy of natural organic acids," Pickerill, in the second part of the quotation above from his paper in this journal (page 317), unconsciously *emphasizes* the difference between his own and the speaker's proposals. What he "points out" has no bearing whatever on anything in any of these annual reports. The speaker, soon after he began his study of physiology twenty years ago, was taught the classical observation that food-acid media stimulate the flow of saliva, and few facts in physiology are better or more widely known. We have assumed this at all these meetings. Pickerill has knocked down a man of straw!

Pickerill does not seem to note the fact that recognitions of priority are impersonal in their broadest effects—they help to define the limits of knowledge; to show the sources and to indicate the reliability of information; and, through the penalties that follow discovered plagiarism and other forms of misappropriation, to prevent the demoralization of literature as well as the confusion of the records of science.

If the first paragraph of the two that are quoted above, from Pickerill's short paper in the September issue of this journal, is not, frankly, *solemn humbug*, what must be thought of the following, *quoted from the preface to Pickerill's book* on "The Prevention of Dental Caries and Oral Sepsis" (1912):

"When this work was commenced, nearly six years ago, 'a plan of campaign' was drawn up to which it was decided to adhere, and to continue the work until the whole field had been covered, or at least investigated to some extent. It was further decided to publish nothing until the chain of evidence was more or less complete. *This has obvious disadvantages*, one of which is the length to which the subject has grown, and another the fact that in several matters the results have been forestalled in publication by others working along similar lines."

If "the work with its results is everything; the man who happens to do it merely the accidental instrument," as Pickerill declares in the recent paper in this journal, from which we have quoted, what in the world is the "obvious disadvantage" of being "forestalled in publication by others working along similar lines!" It is painfully noticeable that Pick-

erill's own name as author appears on the title page of his book; and at the bottom of that title page is the astounding statement in italics: "*All rights reserved.*" Can it be possible that there are copyright and patent laws in any civilized country!

The speaker again paid earnest tribute to the importance, thoroughness and effectiveness of Professor Pickerill's contributions to dental science, urged all present to make themselves fully acquainted with the contents of Pickerill's splendid books, and expressed the hope that the effort devoted by Professor Pickerill to the writing of pointless sermons to his American colleagues would not impair his "subjective" powers as a brilliant and successful investigator.

10. EFFECTS OF PRESERVATIVES ON THE KEEPING QUALITIES OF VINEGAR, GRAPE-FRUIT JUICE AND LEMON JUICE AS PROSPECTIVE DENTIFRICES. If the application of food-acid media to the teeth as dentifrices is expedient, it will be desirable for us to learn precisely which "carrier" and what degree of acidity are best suited for prophylactic purposes. Assuming such a "best" carrier to be available, an important practical matter of a chemical nature will require special attention, namely, the protection of the selected medium against change through the activity of micro-organisms. All the suitable food-acid media are fermentable; they spoil spontaneously unless specially preserved. Even strong vinegar after common filtration usually develops new "mother."

In anticipation of extended studies along these lines, to determine under your auspices *all* the essentials of an approved acid dentifrice, we have begun a preliminary inquiry, into this matter of preservation, with representative food-acid media and typical chemical preservatives.

We proceeded in this part of our study in the following way: Pure cider vinegar direct from a Pennsylvania farm, was used. The juices from lemons and grape-fruit were obtained, with all due precautions, by the expression method described on page 293. Filtered vinegar was diluted with an equal volume of water. To lemon juice, after filtration, was added three volumes of water. The filtered grape-fruit juice was not di-

luted. Preservatives were added to portions of these acid media in *sterilized*, glass-stoppered bottles. The preservatives used were alcohol (10, 15 and 20 per cent.), sodium salicylate, sodium benzoate, boric acid and formic acid, each in strengths of 0.1, 0.2 and 0.3 per cent. Titrations of initial acidity were made, on *June 28, 1913*, in typical samples from each group, with phenolphthalein as the indicator. The mixtures have been carefully examined frequently since then for evidences of deterioration and growth of fungi. In the table below are included indications of the dates on which fungous growth was observed and also the *lowest* proportions of preservative (of the concentrations selected), which prevented deterioration to date.

Acid Solution	Preservative Kind	%	Date on which deterioration was first evident	Acidity*		Difference
				June 28	Oct. 24	
Vinegar	Alcohol	10.0	..	6.7	6.4	-0.3
"	Sodium salicylate	0.1	..	6.8	6.8	..
"	" benzoate	0.1	July 12	6.9	6.9	..
"	" "	0.2	..	6.9	6.9	..
"	Boric acid	0.1	July 12	6.9	7.0	+0.1
"	" "	0.3	Aug. 9	7.1	7.0	-0.1
"	Formic acid	0.1	July 12	7.2	7.1	-0.1
"	" "	0.2	" 12	7.6	7.2	-0.4
"	" "	0.3	Aug. 2	7.9	7.2	-0.7
Lemon	Alcohol	10.0	..	6.2	5.8	-0.4
"	Sodium salicylate	0.1	..	6.0	6.1	+0.1
"	" benzoate	0.1	Aug. 9	6.1	6.2	+0.1
"	" "	0.2	..	6.1	6.0	-0.1
"	Boric acid	0.1	Aug. 2	6.0	6.0	..
"	" "	0.2	" 9	6.1	5.9	-0.2
"	" "	0.3	" 16	6.2	5.8	-0.4
"	Formic acid	0.1	" 9	6.6	6.3	-0.3
"	" "	0.2	" 16	6.8	6.5	-0.3
"	" "	0.3	..	7.1	7.0	-0.1
Grape fruit	Alcohol	10.0	..	3.4	3.1	-0.3
"	" Sodium salicylate	0.1	..	3.8	3.8	..
"	" benzoate	0.1	..	3.8	3.8	..
"	" Boric acid	0.1	July 12	3.8	3.8	..
"	" "	0.2	" 12	3.9	3.7	-0.2
"	" "	0.3	" 12	4.0	4.0	..
"	" Formic acid	0.1	Aug. 16	4.2	4.0	-0.2
"	" "	0.2	..	4.5	4.5	..

* Expressed as c.c. of $n/5$ solution of sodium hydroxid per 5 c.c. of liquid titrated.

The most effective preservatives were alcohol and sodium salicylate, although in the case of the alcohol a diminution in acidity was observed in every case. With sodium salicylate there was practically no change. Sodium benzoate, in proportions of 0.3 per cent. was an effective preservative in all instances. Boric acid failed to prevent deterioration of the mixtures and, in the strengths used, did not show preservative action. Formic acid was not effective in the lower concentrations and, in the case of vinegar, was useless in all proportions.

Mixtures of vinegar and witch hazel in various proportions were also made and the appearance of "mother" noted as follows:

Vinegar	Witch hazel	Water	First appearance of "mother"	Remarks
c.c.	c.c.	c.c.	days	
25	0	25	3	Control
25	10	15	3	
25	15	10	5	
25	20	5	..	None after 2 months
25	25	0	..	None after 2 months
30	20	0	..	None after 2 months
35	15	0	7	
40	10	0	5	

The minimum effective amount of witch hazel (containing about 15 per cent. of alcohol) was 40 per cent. (alcohol present, about 6 per cent.).

The data in this section suggest numerous lines of effective inquiry, which we plan to follow as rapidly as possible.

IV. SOME SUGGESTIONS ON THE INFLUENCE OF INTERNAL SECRETIONS ON THE CONDITION OF THE TEETH.

Our advocacy of the dentifricial use of food-acid media to "keep the teeth clean" has never excluded the realization of other fundamental points of view on the origin and prevention of dental caries. We have not regarded the proposed food-acid treatment as a "cure-all," merely as an *aid* to prevention. In a former statement to your society it was said: "The more I reflect on the available facts regarding dental caries, the more I believe in the *possible influence of systemic*

conditions as factors in its onset and in its progress. I said this in our report two years ago."⁴²

The statement quoted above was followed by a discussion of the relationship between the parathyroid glands and calcium metabolism, with special reference to Erdheim's studies of the imperfections in the enamel of parathyroidectomized rats, and concluded with these remarks (page 217): "I have quoted these statements regarding the parathyroids in order to emphasize my feeling that systemic influences may be operative in the etiology of dental caries. Such statements as those I have quoted indicate strongly the need for open-mindedness in our approach, and the necessity for unconventional methods of attack. . . . Enamel may not be as fixed and as nutritionally unchangeable as dentists have been assuming!"

A few additional facts on this general subject will serve to emphasize the possibilities in this direction.

Basch, in experiments on pups of the same litter, found that excision of the thymus gland promptly caused diminished growth. The osseous structures were imperfectly hardened and body weight was less than normal.⁴³ The thymus gland is very important during early life—during the period when the teeth develop! These facts are particularly significant when coupled with the observations by Gautier and Clausmann⁴⁴ to the effect that enamel contains more fluorin than any other part of the body and that, of the glandular tissues, thymus ranks highest in content of fluorin. Here are strong indications of a dynamic functional relationship!⁴⁵

In general agreement with Erdheim's findings, are the following observations:

"The temporary disposition to dental caries which is so frequently observed in patients after a period of comparative immunity, is, according to Fleischmann, caused by disturbances in the calcium content of the organic portion of the enamel—which in turn are due to disturbances or changes in the internal secretions. This contention, in the author's mind,

⁴² Gies: *Journal of the Allied Dental Societies*, 1912, vii, p. 214.

⁴³ Basch: *Deutsche medizinische Wochenschrift*, 1913, xxxix, p. 1456.

⁴⁴ Gautier and Clausmann: *Comptes rendus hebdomadaires des seances de l'Academie des sciences*, 1913, clvii, p. 94.

⁴⁵ Note the bearing of these facts, also, on our suggestions of a possible substitution, normally, of fluorin atoms for carbonate radicals in the enamel and dentin compounds, page 311.

is fully borne out by the tendency to rapid dental caries during pregnancy, chlorosis, and in cretinism, which conditions involve a marked change in calcium metabolism. The important relationship of the structure of the enamel and the disposition to dental caries has been emphasized also by Baumgartner and von Ebner, who by the aid of carefully prepared microscopic slides of enamel have proved fairly convincingly that metabolism does take place in enamel even after the eruption of the tooth. The facts that enamel is softer in youth than in adult age, therefore much more susceptible to caries, that it changes its color and loses its luster in later years, seem to indicate, in Fleischmann's opinion, that the organic substance in the enamel undergoes progressive calcification, and that the less uniformly the organic substance has been calcified, the more readily the enamel is invaded by micro-organisms. The trend of Fleischmann's argument, which has quite a few notable supporters among European scientists, justifies the hope that it may be possible to favorably influence the calcium metabolism in enamel by therapeutic measures, thereby establishing effective prophylaxis.⁴⁶

We have recently noted the following contribution on the question of metabolism in human dentin:

"The question whether any metabolic changes take place in human dentin after the tooth is completely formed has for a long time been discussed, and opinions are still greatly divided. Charles Tomes, in his 'Manual of Dental Anatomy,' says: 'In the hard or unvascular dentin, some degree of nutrition is perhaps provided for by the penetration of the whole thickness of the tissue by protoplasmic fibers, the dentinal fibers.' Other authorities speak as vaguely about this subject. While some investigators, particularly in America, deny the presence of any metabolism in the completely formed dentin, others as decidedly assume its presence, without giving any conclusive proofs of their hypothesis. The following case that came to my knowledge proves, in my opinion, that a very active metabolism may take place in dentin:

"Mr. K., 52 years of age, a healthy man of a strong constitution, slipped two years ago in the street and fell headlong on his face, so that his chin and nose were bruised and bleeding. The four upper incisors were very painful and a little loose. On closer inspection, a few days after the accident, the central incisors displayed reddish spots, which covered almost half of the labial surface and were darkest in the center. The right lateral incisor exhibited the same aspect, only the red spot was smaller. I advised the patient to have the pulps of these four teeth removed and the teeth bleached and properly treated, warning him that the pulps of these four teeth would die, which would give rise to further complications, while the teeth themselves would become still darker. The patient feared that the proposed treatment would cause him great pain, and

⁴⁶ Fleischmann: *Oesterreichische Zeitschrift für Stomatologie*, May, 1913; abstract from *Dental Cosmos*, 1913, lv., p. 956.

refused to submit to it, and on his own account painted his gums with tincture of iodine.

"My prognosis was partly realized afterward. For some weeks the patient had severe pain in those four incisors, which finally wore off. The reddish spots on the two central and the right lateral incisors had become dark blue, and had almost the color of a so-called blood-blister. Once more I advised the patient to have these teeth properly treated, but without success. For some time I did not hear any more about this case.

"The patient later communicated to me that those discolored teeth had become white again, which I at first would not believe, but a single look at his teeth convinced me that his assurance was true. On my request, the patient allowed me to ascertain by the aid of the electric current that the pulps of the affected teeth had retained their full vitality. I also noted that the spots which had been dark blue were still faintly distinguished from the rest of the tooth by a yellowish, hardly perceptible tint.

"Now, four years later, the sound teeth are still in the same good condition, and the pulps react normally.

"It is evident that we have here an extravasation of blood which had penetrated the dentin, was decomposed, and almost entirely resorbed again after some time. In my opinion this case is not to be explained in any other way than by acknowledging the presence of a fairly active metabolism in the dentin."

It is plain that such facts as the foregoing, which pertain to the possibilities of normal *nutritive* changes in the dentin and enamel (*internal*), are important indications for future investigation. It is also evident that, coupled with the probabilities of normal *absorptions (retentions)* from the oral secretions (*external*), they emphasize the necessity for breadth of view and interest in the experimental study of dental disease in all its aspects.

V. SUGGESTIONS OF MAIN LINES FOR EARLY INVESTIGATION.

In concluding this report the speaker discussed in some detail the advisability of proceeding further, under the auspices of the Society, as promptly as possible along the general lines indicated by the appended memoranda:

A. Prepare, for publication in book form for the encouragement and support of future dental research, a complete set of abstracts of the essential literature on dental caries and related disorders, suitably arranged in chapters, with appropri-

* Mertens: *Dental Cosmos*, 1913, lv., p. 860.

ate criticism appended to each abstract and with a summary of conclusions at the end of each section.

B. Continue and extend the study of the effects of food-acid media on teeth, in a fairly large number of people, *for at least five years continuously*, under the supervision of dentists selected by the Research Committee; also on extracted teeth both in the presence and absence of saliva, under various controlled conditions approximating those of typical oral environments.

C. Determine the chemical and physiological properties of the leading dentifrices on the market, with the avowed intention of publishing, as a matter of public service and in a strictly judicial temper, the merits or lack of merits of each preparation examined.

D. If further study warrants such a course, determine in detail the properties of the food-acid media that would be most suitable for prophylactic recommendation, authorize and control the official preparation and public sale of such media at the lowest prices consistent with honest and efficient production, and deposit all royalties in the Society's treasury as a *permanent endowment for the furtherance of continuous dental research*.⁴⁸

E. Determine the *chemical* qualities of enamel and dentin under normal and abnormal conditions, with special reference to the indicated possibilities of internal (*nutritional*) and external (*oral*) modifications that affect susceptibility to decay.

F. Study systematically the effects, especially on children in suitable institutions, of diets terminating with the ingestion of acid ingredients, all subjects to be under the professional

⁴⁸ The speaker reminded the Society, in this connection, that he had never accepted any payment whatever for his services as the Society's instrument in these investigations, despite the fact that his only income is his salary as a university teacher—that he accepted the Society's invitation, four years ago and its annual renewals, as calls to special public service. He further declared that he would adhere to this ideal of service in the future—that he would accept no remuneration; and, also, that under no circumstances would he consent to destroy the happiness this work was affording him, or subject his motives to suspicion, by putting on the market through a private agency any product that might be supported by the findings of any of his researches. He believed that the Society, if it followed his suggestion, as stated above (D), could set an example in professional loyalty that would be of inestimable public service, directly, indirectly and continuously. He urged all present who might be connected with the exploitation of commercial products of doubtful value—and he said he had been reliably informed that several members of the Society are thus commercially related—to break such connections, in the interest not only of personal self-respect but of higher and more faithful professional influence.

observation of dentists selected by the Research Committee.

G. Determine the possible influences of internal secretions, in health and disease, on the state of the teeth.

H. Ascertain the nature and the reasons for variations in the quality and quantity of the "protective" constituents of the saliva.

Additional general researches were suggested, but as they would be beyond the possibility, in the speaker's estimation, of successful inauguration during the next twelve months with the above preferred programme before the Society, they will be considered in a future report.

THE PRACTICAL ASPECT OF THE ORAL HYGIENE MOVEMENT¹

BY SIDNEY J. RAUH, D.D.S., CINCINNATI, OHIO.

Dentistry is at last beginning to realize in action as well as name that it is a PROFESSION, and no one factor conduces more to this condition than the broad principle of PREVENTION, which must be the fundamental basis of the Mouth Hygiene Movement.

In primitive times each individual was a force unto himself. He lived through his ability to collect the necessities for life, and through this very effort became physically strong. To-day we live in communities, many of them very large, creating a series of problems which we are attempting to solve. In the primitive state the "survival of the fittest" applied to the physical; in this age, mental capacity gives us our position in society. The so-called diseases of civilization have rapidly developed; only within recent years has there been any effort made to control, much less to cure them. Tuberculosis, the Social Diseases and Caries are probably the most prominent of this type of disease; there are well-organized movements for the control of each.

Naturally the dentist must lead in the mouth hygiene movement, for in the end it requires the specialist to solve this special problem. How can this be done? There are three main branches to our movement—Education, Dental Inspection and Free Clinics—each dovetailing, no one complete without the others.

With the Cincinnati work as a basis, an attempt will be made to evolve plans that can be worked in different communities. The size of the problem will have to determine how these plans should be modified to suit the local situation. In some parts of the country absolutely nothing has been done; in others there are well defined movements. For this reason it would be of interest to suggest a plan for starting the work, where nothing has been attempted.

¹ Read before the 49th Annual Meeting of the Massachusetts Dental Society, May 8-9-10, 1913.

First and foremost—ORGANIZATION is necessary. This means DENTAL ORGANIZATION, no matter how large or small the population may be there must be a complete understanding among the members of the profession if anything is to be accomplished. Practically every large center has a Dental Society, which is a working force for the solution of all dental problems. If this be not the case the logical step is to make it such. Organize from this central body a strong Oral Hygiene Committee, with a chairman who is imbued with the spirit of his work. Without this there can be no success.

Next, the authorities of the school system and health department should be approached and permission obtained to hold the first dental inspection, which brings us to the point of the method. Suitable blanks are filled out, according to the accompanying diagrams. The name of the child, age, room number, address, etc., are filled in before the child enters the room—which card the child presents to the examiner.

One of the original parts of the Cincinnati work was the development of a strong volunteer force of women to do our recording, tabulating, sterilizing, and all other clerical work which is very large when a number of schools are to be examined. To organize this corps requires a bit of executive ability; their interest goes far beyond the actual work involved in making prominent the movement among the citizens of the community. Do not attempt to diagnose, perform any operation, or do anything more than merely enumerate the defects that are seen in the mouths, for if you do there will be conflict in the profession, for no two opinions can be relied upon to be the same as to either diagnosis or treatment.

DENTAL INSPECTION.

The same general scheme may be employed for a single inspection as for regular work, selecting the most convenient date of the week, which means consulting the school. The dentist and the volunteer should then adhere to this time. Any ordinary large table can be used with a chair at either end; one table being enough for two inspectors. Inspector stands facing the window, or, if he so desires, may sit facing the

patient. The assistant is stationed at the table with back to the window thus facing the examiner. In addition to this, there should be one other assistant to sterilize the instruments. For this purpose, solutions of carbolic acid, about 1 per cent., are employed, in which all instruments are immersed. From this they are immersed in hot water before being put in the mouth just prior to the examination. A solution of bichloride of mercury, 1 to 1,000, in a bowl is at hand, and the operator immerses his hands in this, prior to the examination of each child, sufficient towels, of course, being employed for him to keep his hands dry. Wash the hands in running water as frequently as practicable.

Starting from one side of the mouth, say, superior left, the examination is made, ending at the upper right, then below inferior right to left, calling out each defect of the permanent teeth to the assistant, who marks them on the blank. In the meantime the assistant can start to ask the questions of the child, which are enumerated on the blank. It will require, however, a combined questioning, as well as examination, to finally decide the answers to most of these questions.

The question, *Does Child Brush Teeth?* must be answered by the examiner, as the child's answer is not sufficient, he usually answering "Yes," when the operator can plainly see that the brush is not used.

Family Dentist?—is for the purpose of assisting the social investigation so as to preclude the possibility of imposition on the part of the patient, and is only an assistant to the final decision as to whether the child shall receive free treatment in the clinic or not.

Condition of Mouth?—means the general condition of teeth, both temporary and permanent, gums, and any other defect which may be present in any part of the mouth.

Condition of Gums?—is self-evident.

Teeth Filled?—will help answer the question of *Family Dentist*, for if answered in the affirmative it will be an easy matter to find out who did the work.

Mal-occlusion?—should refer only to general irregularities which affect either mastication or general health of the patient.

Under "*Remarks*"—any extraordinary condition should be reported.

Disposal of Case—is to be filled in later to show if case has been treated, if so, whether by free clinic or private practitioner.

Condition of Temporary Teeth—under this heading the general condition of temporary teeth is noted, as it has been found to be impracticable to specifically note each defect, the dentist who finally treats the case must decide what must be done with this very perplexing problem.

When the inspection is completed, the forms are turned over to the volunteers, from these the notification blank filled out, which is sent to the parent of the child. The results are also tabulated upon one of the large school blanks which will be shown.

At every inspection, a short talk should be delivered to the teachers of the school, explaining the scope of the work and instructing them how to brush the teeth and how to inform the pupils to do the same. If the children can be reached, a talk should also be made to them, for in this way general interest is aroused, and it is surprising what direct results can be obtained just through an inspection, even though a free clinic be not in existence, especially in smaller communities.

If the work is to be done on the best basis, a follow-up system should be in force, so that those children who have not been attended to within a reasonable length of time shall be induced to receive treatment.

UNDER NO CIRCUMSTANCES should any operation, no matter how trivial, be attempted, such as extraction of loose temporary teeth, for the sight of blood is sometimes sufficient to disrupt an entire school, and the province of the inspection in the end is to draw attention to defects, not to cure them.

Upon the blank, no diagnosis should be made unless it be an extraordinary condition, such as active syphilis of the mouth or some similar condition, for the practitioner must have the privilege of deciding what shall be done.

Strive for accuracy, not speed, in inspections. In those communities where there are professional workers, such as

School Nurses, District Physicians, Dentists, and Dental Nurses, the work will be made much easier, but there must be a thorough co-operation between these forces. Remember that co-operation is the crying need of the day, for which reason employ all existing forces, such as Tuberculosis Associations, Charity Organizations, Welfare Organizations, etc., to assist in your work as well as assisting them in theirs.

Some of the dentists will state that their time is too valuable to be spent in this work, in which case they should give the cash equivalent, or employ some one to do their part of the work.

FREE CLINICS.

In order to organize a free clinic, the sympathetic attitude of the public must first be obtained. This can be done in various ways. Appear before all organizations of any kind existing in the community and explain to them the necessity for the work, using as a basis, the results of the inspections which have been made. The active co-operation of the Board of Education and the Board of Health must be had, for in the end, whether the free clinic be under municipal control or private initiative, it cannot do effective work without these. If possible, the clinic should be located in a public school building; in large communities, it is better to have them widely distributed. This assertion is made with great diffidence in Boston, in view of the fact that the Forsyth Clinic is about to be opened, but when you take into consideration the fact that the children who attend these clinics come from the poorest families, the item of car fare, time, etc., is most important. Furthermore, the moral effect of having the clinic under their observation at all times is educational.

It is probably true that the large clinic can be run somewhat cheaper proportionately than the small one, but the results obtained, we believe, are worth the slight additional expense. It will be most interesting to note how the Forsyth institution will work out, for this may disprove this latter theory.

Expense of Free Clinic.

SALARIES.

Chief Dental Inspector (full time).....	\$1,500.00
Three Operators at \$50 per month (10 months).....	1,500.00
One Operator at \$60 per month (10 months).....	600.00
Chief Assistant (full time).....	600.00
Second Assistant (full time).....	450.00
Third Assistant (full time).....	350.00
	<hr/>
	\$5,000.00
Equipment	800.00
Supplies	500.00
Office, etc.....	100.00
	<hr/>
Total	\$6,400.00
Approximate number of patients treated....	2,500

It has been found that those young practitioners who desire the clinic positions at a salary, prefer working half, to the entire day, for in this way they can build up their practices while earning the additional salary, as well as acquiring an experience which comes to few young men who start directly into practice after graduation from college. We would advise any young practitioner, who believes in a high standard of dentistry, to secure such a position, for it will teach him how to work, how to handle large numbers of patients, and many an interesting case will be seen that may take years of private activity to present.

LECTURES.

Different schemes have been brought forth in various centers for the development of the oral hygiene idea. Some believe in the Free Clinic scheme; that if you handle the poor children, those of the better class will rapidly follow—this being all that is necessary to develop the child's mind along those lines. In the free clinic he will be instructed how to brush his teeth, take care of his mouth, etc. Another group believes in the educational scheme in which the lecture and

pamphlet form an important part, it claiming that if you educate the child sufficiently, he will in some way receive the proper treatment. The third class advocates dental inspection, saying this will educate, the child eventually receiving treatment the same way as from the lecture.

However, from our experience, we think it is only a combination of all the forces which can bring the general solution; even then one must be content to be patient and await results.

In the lectures, the stereopticon should be employed if possible, also large models, large toothbrushes and possibly most important of all, use the toothbrush in your own mouth to show the proper method of brushing; for it has been shown through the entire kindergarten system, that it is the visual demonstration that impresses the child. This will also apply to the adult.

In order to demonstrate the effects of dental inspection with a follow-up system, we quote the following results: These two schools were examined in January, 1913, with these results, in less than four months, and both schools were in so-called poor districts:

First Intermediate—Number examined, 664; applying to private practitioner for treatment, 265; to Free Clinic, 120; those having no defect, 74; withdrawn from school, 35; leaving, 170, who require further treatment; in other words, 75 per cent. of the school were reached in this short time.

Highland School—Number examined, 326; private practitioner, 116; Free Clinic, 88; no defect, 22; no treatment, 114; percentage reached nearly 70 per cent. The children are still applying for service.

Herewith are shown results of general dental inspection—Tables I, II, III, and IV.

EXPERIMENTAL CLASS.

Several years since in Cleveland, an experimental class was instituted for the purpose of demonstrating the efficacy and necessity for Mouth Hygiene. Remarkable results were shown with which you are all probably more or less familiar. Unfortunately, however, no "control class" was formed with

which to compare the results, and in addition only very defective mouths were chosen. We, believing that these experiments should be made in an ordinary class room upon all classes of children, selected two classes in a school situated in one of the poorer districts of Cincinnati. They were the same grade, the age environment and general conditions of the children being the same. A series of psychological, physical, scholarship, attendance, behavior, appearance, manner, social and other tests were made and tabulated at the beginning of the school year. After this the mouths of the children of the "experimental class" were all placed in hygienic condition, those of "the control" being merely examined. The children of the "experimental class" were given regular toothbrush drills, periodical test dinners at which they were taught to chew, and a general supervision of the mouths was regularly maintained. At the end of the year all the tests were repeated and a comparison made between the two classes. Mr. Hauer, the principal of this school, reports the following as to results in his summary:

FIRST—ATTENDANCE.—The average monthly absence of the Experimental Class is a little less than that of the Control. There could not possibly be much difference, because we watch the attendance of all the children very closely. We have either a truant officer or probation officer at school four days out of five, and the absent list is sent to the office every day. So you can readily see there is "not much chance."

SECOND—SCHOLARSHIP.—In the latter part of January, an examination was held, and both classes were given the same questions. The teachers were conferred with as to how each question should be marked, and where there were several parts to a question as to the value of each part, so that all the pupils would be marked alike. I afterward looked over the papers to see how the pupils did, and found that they were marked in accordance with instructions. The class average, in arithmetic, geography, and spelling, the subjects that would test their scholarship, was 16.5 higher in the Experimental Class than in the Control. In other words, the class average in these subjects was 85.4 per cent. in one class and 68.9 per cent. in

the other. A very pronounced difference, you will observe. The lower average of the two is, I thought, about normal, because the questions were not easy. The difference may not be wholly due to the dental attention given to the children, for one thing entered into the experiment that we at school could not control, though we tried to—this was that the Experimental Class found out at the end of two months that it was such. I mention this fact in order to treat this topic fairly and impartially.

THIRD—PHYSICAL IMPROVEMENT. — The general appearance of the pupils, for a downtown school, has been above par. In some instances the improvement in this direction cannot be appreciated unless you knew the pupils then and now. It is, indeed, a pleasure to note the pride they have in their personal appearance, and the splendid manner, spirit, and general attitude they manifest in their class work.

Miss Conkey, who had charge of the psychological tests, says in her conclusions:

"In a general summary we find that there is a decided lead taken by the Experimental Class. This holds true in all but one of the psychological tests. In the purely physical test the lack of gain in weight might justly be accounted for by the strain and nervous tension incident to the dental treatment which in some cases continued over a long period. It is quite possible also that the gains in the various tests would have been greater had it not been for this conflicting element.

"While the Control Class led six times when the tests were first given, it leads but once in the final series. On the other hand, the Experimental Class maintains her own four leads and passes five of the six leads of the Control Class.

"To make the above comparison more valid, we hope to follow these classes for another year, submitting each to a second series of tests at the beginning and close of the school session. The element of dental interference in the Experimental Class will be slight since the original timidity has been overcome, and but little treatment will be needed to keep the mouths in their present good condition."

Realizing that one year's work was not sufficient, we have

adopted the same procedure this year, and in due course of time we hope to publish these results. Unfortunately at this time our data are not in scientific shape to present to the public. The results, however, are plainly seen, and the children enter into the work with an enthusiasm that is scarcely believable. It has been necessary this year to cleanse the mouths of but three children out of a total of fifty a second time, and we can assure you that these three would be quite up to the average of the ordinary child applying for service in our offices.

EXHIBITS.

At various times it becomes necessary in the educational work to show to both the profession and the laity what is being done, and for this purpose we have an exhibit, part of which is shown at this meeting. It consists of statistics pertaining to the work, various mottoes, models, photographs and usually one of the dental supply houses supplies a model dental office, which always attracts great attention. We would particularly call attention to the models, for they serve the purpose of attracting the public, and it is always necessary to have some one conversant with the work in charge to explain.

OTHER INSTITUTIONS.

Almost all the work in the Oral Hygiene branch has been directed to school children. In all communities there are various institutions, such as Orphan Asylums, Children's Homes, Homes for Delinquent Boys and Girls, etc., all of which should have competent dental attention. It becomes necessary in these cases to do propaganda work to interest those in charge to regularly employ one or more dentists. This has been done at the House of Refuge, Cincinnati, where for almost two years, one operator, working half a day, six days per week, is constantly employed. The children in this institution regularly employ the toothbrush, and the results are most gratifying. The city pays this man, who is under the Charities and Corrections Department. In our new City Hospital, which will be dedicated in a few months, a magnificent den-

tal room will be part of the equipment. All these things have been made possible by a well-organized committee of the Cincinnati Dental Society.

HOW TO INTEREST THE MUNICIPALITY.

It is most frequently asked, How do you do these things? BY PERSISTENT, HARD, NEVER-ENDING EFFORT. We make it our business to meet the various heads of all branches of the municipality that have to do with any and all institutions that may be benefited by our work. This starts with the Mayor of the city, includes the Board of Education, Board of Health and their employees.

We believe Mr. Dyer, the Superintendent of Schools of Boston, can verify this statement, and I would request that in his discussion that he bring out how this was done in his department when he was superintendent of schools of Cincinnati. At the start of our work, we had trials and tribulations with various principals and school teachers. Finally most, if not all of them, at least if not enthusiastic about our work, tolerated the same.

HOW TO INTEREST THE DENTISTS.

Unfortunately this problem is as difficult as any of our others. Not until our profession has realized that it is only through its general service to the public that it will be properly recognized and appreciated, will this movement take its proper position beside the great progressive problems of the day. Each and every man must do his part, and there is a place for every man. How can we obtain the time? No one has time, he makes it. We have frequently noted that it is the busy men, who have their affairs properly in order, that respond. At least 75 per cent. of the members of the Cincinnati Dental Society to-day are contributing either their service or money to our movement, and if one does not do so, we never stop until he is interested. We only elect those men that show themselves capable and willing, to office in the Oral Hygiene Committee, and, if the interest of any one grows less, we appoint a new man to take his place.

SOCIAL INVESTIGATIONS.

There seems to be a general fear that numbers of unworthy cases will present themselves at Free Clinics, and there is some ground for this theory. Therefore, it becomes necessary to employ some one, preferably a woman, who knows something about social work. No case must be allowed in the clinic without proper recommendation, and, if any doubt exists, it must be investigated. The school nurse is usually in a position to make this investigation, and, if not, the various charitable organizations must be called upon. In some cases we make our own investigations, but we believe that the true American spirit will prevail, and that our citizens will not allow free treatment, if they can afford to pay for same.

THE DENTAL NURSE PROBLEM¹

BY WILLIAM P. COOKE, D.M.D., BOSTON, MASS.

The problem of the Dental Nurse is not seriously considered by the majority of the dental profession. There has been some effort made to show the value of this aid to dental practice, but much needs to be done before this help will receive proper recognition.

The dental practitioner has claimed that dentistry is a specialty of medicine. The barber, the doctor, the dentist—all in one, started at the same place. The physician came out; he grew; the dentist stayed on; but later, he too came away and set up for himself; the barber stayed. What has made the difference? Why should not one man do all now as formerly? The service rendered is the cause of the advance. If the physician did no better service than formerly, he would be where he commenced. The dentist has advanced, not on account of his skill, but on account of the value of the service he renders to human life. The physician had his helper to whom he gave the directions; she was the woman of the home; she carried them out. Some became more skilled in nursing the sick and were called in by their neighbors and were named nurses. As the apprentice method in medicine passed out, the need of the nurse became greater; the value of uniform training became evident. By co-operation the nurses' training school was established; later came the legal registered nurse to separate her from the non-registered nurses without a standardized training. The dentist followed the apprentice system; he had the help of this apprentice until the dental law took it away. The dentist had then no helper. He began to employ female help to care for his office. He wore himself out doing little things that could have been done by a woman helper. Gradually the men with the best economic sense used women to do the book-keeping and making of appointments. This service was followed by the woman laboratory assistant,

¹ Read before the 49th Annual Meeting of the Massachusetts Dental Society, May 8-9-10, 1913.

the tooth carver, the maker of orthodontia appliances—gold and porcelain inlays—the assisting in dental operations by mixing cement, amalgam, the sterilizing of instruments. All these things have been a growth; they have proved the right of woman to her place in a dental office.

The line has been so drawn by many dental laws that anything done upon the mouth and teeth shall be considered as practising dentistry.

All the services rendered by women thus far have been to help repair the damage done by decay. No organized effort has been made to find out if decay may be prevented. The dentist by law is compelled to know all and do all. As long as we hold the position that no one but a graduate can do anything in the mouth we cannot be considered a branch of medicine. The principle at stake is not how much the assistant or nurse shall do for the patient, but it is the right of the physician to have the trained help he needs to carry out his directions. He is the responsible party; the nurse is only the means to the end; the quality of the service rendered is what counts. Now, this same principle applies to dentistry. A dentist who is qualified to receive a degree and to have a license to practise should be such a person that he can, if he so desires, have any help he needs in rendering the best service to his patients.

There is an economic principle involved in the proposal to use a trained woman's help in the care of the teeth and the mouth. The dental law is for the purpose of protecting the public; the law is not God made, but man made; if, like a garment, it does not fit or is out of style, it should be changed.

If all dental operations had been performed with skill and care by all, we should not have needed any law. The law was not made to limit the field of a man's powers, but to secure for the public a safe service. Has it done it? No. There are more fakirs than ever before. The law should, like the moral law, be a schoolmaster to bring us to the greater good. It has not transformed the unscrupulous dentist, but it has prevented the good man from doing his best. A dentist can give better service to his patients if he has a woman assistant to mix his amalgam and cement, provide his gold and sterilize

his instruments. Suppose he has a woman trained to do minor operations in the mouth, to spray out the food and remove the soft deposits on the teeth; if the woman does this well, is the patient harmed? Why should the dentist use a woman assistant in sterilizing and mixing fillings and not use her in doing minor work in the mouth for his patients? The patient is as well served, but you say the law is broken. Is the law for the public or for the purpose of forming a dental trade union that shall tell the registered dentist just how he shall do his work?

When you take this view of a dental law you are not a professional man; you are not even a business man; you are a man who believes in the worst features of a trade union—namely, the making of the best man as poor as the worst workman, a limiting of the product so as to prolong the job and increase the price; a pulling down, not a building up process. This economic principle recognized and applied in medicine must be applied in dentistry. The only part the State has in the matter is to see that the woman assistant, call her by what name you wish, is trained to render the service she is to perform. A man has no right to waste treasure. Because he can pay for twenty tons of coal each year, he has no right to throw half of his into his ash barrel, when by care ten tons would serve his need. So a man has no right to prevent by law a man's development of himself and of his dental practice. The details of the service a trained woman assistant will render in a dental practice can be easily worked out. The point which needs to be emphasized now is the principle of having such a service legal in Massachusetts. I will read a letter upon the dental nurse question by a well-known educator. This letter is a copy of one sent to the Senate chairman of the Committee on Public Health:

CAMBRIDGE, MASS., March 6, 1913.

DEAR SIR: I beg leave to say to you, in support of the present movement for legalizing the calling of the dental nurse, that the usefulness of that calling has been abundantly proved in private dental offices as well as in hospitals and dispensaries where dental patients are treated, and also in the inspec-

tion service of schools and other public institutions. There is no more doubt about the serviceableness of the dental nurse than there is about that of the surgical or medical nurse.

A recent and highly useful development of nursing is district nursing. Here, too, the dental nurse is quite as useful as the nurse who now treats medical or surgical cases.

It follows that schools ought to be set up expressly for the training of dental nurses, and that properly trained nurses should be registered and controlled by some board commissioned by the State.

Very truly yours,

(Signed) CHARLES W. ELIOT.

RELATION OF RIGG'S DISEASE AND REMOVABLE BRIDGE WORK¹

BY DR. HOWARD T. STEWART, NEW YORK CITY.

I am often asked why I adhere to the name of Rigg's disease. Now, did it ever occur to you that pyorrhea alveolaris is not only an inadequate, but a very misleading name? And did you ever stop to think how many names have been given us for adoption, each one supposed to be a truly descriptive name? Here are some of them: Alveolar Utitis—Ptyalogenic Pericementitis—Infectious Alveolitis—Odonta Lithus—Hematogenic Pericementitis—Hematogenic Calcic Pericementitis—Pyorrhea Alveolar—Cemento Periostitis—Infectioso Alveolitis—Chronic Alveolitis—Loculosis—Gomphiosis—Blennorrhoea Alveolaris—Gouty Pericementosis—Conjoint Suppuration of the Gums and Alveoli—"suppurative inflammation of the gums and absorption of the alveolar bone"—Pyorrhea inter alveolo dentaire—Gingivitis Expulsivi—Osteo periostiti alveolo dentaire—Infectious Alveolitis—Phagadeno-pericementi—Calcic Pericementitis—Phagadenic Pericementitis—Interstitial Gingivitis, and last but not least, Meddallas Chronic Alveolar Osteomyelitis. Now, out of all this number, I challenge you to find a single name less suitable than pyorrhea alveolaris. Why should we say "pus of the alveolus" any more than we should say pus of the liver, pus of the brain, pus of the mandible, or pus of any other part of the body as naming the particular disease that caused the pus? In Rigg's disease we do not even always have pus! Then pyorrhea alveolaris is positively a misleading and harmful name. Rigg's disease is at least not misleading, and we all understand by it "that group of inflammatory disorders," with which we all are so familiar, that result in the breaking down of the tissues supporting the teeth. Taylor, of Washington, divides Rigg's disease into four separate diseases:

1, Pyorrhea Alveolaris; 2, Phagadenic Pericementitis; 3, Arthritic Pericementitis; 4, Atropic Alveolitis.

¹ Read before the First District Dental Society, S. N. Y., Nov. 3, 1913.

This classification might at least do much to avoid that state of affairs so often occurring where one dentist tells a patient that she has Rigg's disease (or pyorrhea), and another tells her that she has not.

This paper is to deal with the relation of bridge work to these conditions and not especially to the disease itself, but I could not refrain from referring at some length to this name "Pyorrhea Alveolaris," which I feel should be discarded before it has taken such a hold on the profession that its eradication will be impossible; and I wish to enter a solemn protest against its use.

This disease has so long been considered incurable by the majority of the profession (and is to an even greater extent so considered by the medical profession), that when we say that fully 95 per cent. of the cases presenting themselves are certainly curable, the statement is received with great incredulity. This belief has taken such a hold on the profession, and also on the laity (and with good reason), that in the very extensive cases where bridge work is necessary it is usually more difficult to keep the patients encouraged through the long treatment than to cure the disease.

In selecting abutments for bridge work in Rigg's disease conditions, we usually find such teeth with much of the alveolar bone absorbed. As a rule, we devitalize such teeth and cut them off near the gum line.

This for three reasons:

First. We have less than one-half of the tooth substance left to be nourished by the weakened membrane. This cutting away all the crown and much of the root with the idea of confining the vitality to the part that is left, I advocated some fifteen years ago; and, although few agreed with me, I have had no reason since to change my views. On the contrary, constant clinical experience proves that these teeth have a great advantage over those with the crown left in place, no matter how these may be splinted or braced. At the same time I also advocated the scraping or planing of root surfaces, in a paper the title of which was, "Partial Removal of the External Layer of the Cementum." This seemed to attract very

little attention at the time, but since then I have had the pleasure of seeing several sets of instruments manufactured for this express purpose.

In 1893, Clement, of Mississippi, demonstrated with the microscope the hypercalcification of the external layer of the cementum, obliterating the lacunae and canaliculi. Clement argued that this rendered a cure of the disease impossible. I drew the opposite conclusion, and began to remove the external surface of the cementum in the effort to re-establish vital connection with the organism.

While the planing of root surfaces is important, I think it is being overdone, and has come to be looked upon by many as being the only thing necessary to a cure.

The second reason for cutting off the crowns of these teeth is that this removes all stress from the roots and gives them surgical rest during the healing process.

The third reason is that these roots can then be made conical and shaped accurately for the reception of a band.

Suppose we devitalize a molar for an abutment. It is impossible to shape this with the greater part of the crown remaining, with the same accuracy and certainty as when the crown is out of the way. On these roots can be fitted a thirty-four gauge pure gold band. This can be burnished accurately to the root. Then after a floor is soldered on and pin or tube soldered in position, this can be replaced on the root, and previous to final adjustment the edges slightly crimped, then annealed enough to take out any possible spring caused by the crimping, and replaced carefully on the root. This is then removed, carefully invested, and twenty-two karat solder flowed over all the band. This gives a stiffer band than coin or twenty-two karat plate, and an accuracy of fit that is not possible with these materials.

The reason for annealing after crimping the edges of the band is that if the edge springs in the slightest degree, the edge of the band will hang after the solder is flowed on and will not go to place.

For years I took modeling compound impressions of these roots and swaged cap and band in one piece on cement dies,

burnishing the edges, and these have under the gum their distinct advantage; but, on the whole, the band can be made to fit more accurately at the edge when fitted to the tooth—and this is the vital point.

I wish to call attention to the fact that though the root ends are made slightly conical to receive these bands, that the floor extends out far enough to allow the solder to more than restore the natural shape of the root. I say "more," because when the gum has receded, the root just under the gum has not the same shape as the enamel in normal position. And so the solder is best built out about the same fullness as the original enamel.

It is my experience that a gum will keep far healthier about a band shaped like this than when it is straight.

The greatest care must be exercised in the preparation of these roots, the adjustment of the band and the subsequent care of the abutments.

1. The root must be accurately shaped, even if the gum has to be packed back to allow us to see the end, and oftentimes this exposure will astonish us by revealing the imperfect preparation under the gum.

2. The edge of the band should, after contouring with solder, be disked, as a certain amount of "saw edge" will be present

3. The entire solder surface should be polished to the very last degree.

4. The solder on the band, being the shape of the enamel, serves as a guide to the floss, allowing it to go naturally and easily beneath the gum margin, when a straight band would not. When applied in this way the bands not only are not deleterious, but by guiding the silk to the edge they actually aid the patient in his prophylactic work.

Before speaking of the bands and the bridge work, we might more properly have considered the selection of abutments. Sometimes this is a difficult task, and requires the greatest judgment.

Suppose we have a case where in one arch two or three teeth have been lost from Rigg's disease. Maybe two others

have practically no bony attachment, and we know that they must be extracted. Then maybe there are four others with so much alveolar tissue gone that they are doubtful. We don't know whether they can be saved at all or not, and perhaps two of them will respond to treatment, so as to promise permanency, but the other two do not. Now, we are nonplused as to which teeth to extract, and also which to use as abutments for bridges. We are still further embarrassed by the fact that the patient wants none of them extracted. Possibly he came to us because he understood we saved diseased teeth; and he cannot understand why we wish to extract not only the two hopeless teeth, but also a few more, when his regular dentist, who referred him to us, never extracted any of his teeth. Just at this stage, the patient often relieves us of our embarrassment by returning to his former dentist.

Now, if we make a bridge for this case our object is to get as near a permanent condition as possible. We do not want to use a tooth simply because the tissues appear to have assumed a healthy condition, if this tooth is liable in the future to act as an irritant and endanger the adjoining tooth. In other words, we are aiming at a permanent eradication of the disease from the mouth and a permanently useful bridge.

The inferior incisors often present a very puzzling condition. The centrals are quite loose, the laterals fairly loose, the cuspids fairly firm, but the gum and bone tissue in a chronic state of inflammation. At first we think there is alveolar tissue enough to justify us in retaining all the teeth, but when we begin to operate carefully about the centrals we find that it is nearly all soft tissue about the roots and practically no supporting bone. What are we going to do? For these to last permanently standing alone, seems out of the question. Shall we splint them with a fixed splint and risk that ever-recurring inflammation which constantly threatens tissue about such teeth?

No matter how skillfully we may operate—no matter how beautifully they heal—no matter how pink and hard the gum—or how firm they are under the splint—no matter how much prophylactic treatment we may give them, that inflammatory

condition constantly threatens. And it is more far-reaching than immediately about these two teeth; or these four teeth; or even these six teeth—"Aye, there's the rub."

Now, what are we going to do? We know, to begin on, that the patient will object violently to the extraction of two teeth. And if we extract the centrals, and the laterals are badly involved, shall we also extract these? And if we do not extract them, shall we attach a bridge to these laterals? And if we attach a bridge, shall it be a fixed bridge or a removable one? And shall we attach the bridge to the laterals only, or shall we attach it to the cuspids also?

We ask ourselves these questions:

1. What will most please and content the patient?
2. What will be the least taxing?
3. What will be the most permanent for these particular teeth?
4. What will exert the most salutary influence on the entire mouth irrespective of these teeth?

Only a few days ago I saw a patient whose mouth had been operated on. Beautiful prophylactic work had been done. Fine results around all the teeth in the mouth, as good probably as could have been got by "scaling" and prophylactic work alone.

But three of the teeth were clearly beyond hope of permanent result to begin on, and so in a few months inflammation again started up about these and the tissues began to suppurate.

Whatever the operator may have told this man, the impression he had when he was discharged was that his case was cured, and when later on he began to have trouble with these three teeth his impression then was that his case was not cured. He felt that the operator had not been fair with him, and that he had been promised something that had not been given him.

I explained to this man that the reason why the operator had tried so hard to retain these teeth was to please him, and not that he felt sure that they could be permanently saved.

I further assured him that, leaving these three teeth out

of the question, the benefit that he had received to the other teeth was worth much more than the money he had paid out. But this did not assuage his grievance. He said, "Now, after all this has cost me, just look at my mouth." But he himself did not look at his mouth. He looked only at those three teeth. How much better it would have been for both patient and operator, if these had been extracted! Now, in just such a case as this we are tempted to put on a fixed splint. This splint holds the teeth steady and firm, and the patient is greatly pleased. Moreover, the day of his dissatisfaction is greatly delayed.

Dr. Rhein, so far as I know, was the first man to devise and call attention to the fixed splint, and in good hands it has in the past done some considerable service. In those days we must remember, practically the only method of replacing such teeth was by a partial plate. But fixed splints, on the whole, have, in the essayist's humble opinion, done more harm than good.

And this for two reasons:

1. They are used indiscriminately by men who do not control the inflammatory conditions about the roots of the teeth which they splint and hold in position.

2. They are more than questionable even in good hands where they last, as most men count on their lasting, maybe, four or five years, doing, as they say, good service during that time.

But are they doing good service? Suppose they last four or five years! What finally causes the loss of these teeth? These teeth are finally lost on account of a chronic inflammatory condition that is insidiously set up about their roots a very long time before they are lost; an inflammatory condition that is not confined to the tissues about the roots of these teeth, but throughout the entire alveolar process; and so it is a question not as to whether we can retain these teeth in position for a few years, but whether this will be for the ultimate good of the mouth.

I grant you it is perfectly true that many careful operators adjust these splints and maybe for years, by very close

attention in favorable cases keep these tissues comparatively free from inflammation and produce good results. But usually these teeth would have stood alone after being temporarily splinted, and would have been better off. And it can be put down as a fairly safe axiom that *when a tooth will not stand alone after being treated and temporarily splinted, it is best either extracted or included in a removable bridge.*

A fixed splint of any description on teeth, preventing individual motion in the socket, seems not to have a beneficial influence as to permanent results. For this same reason we object to fixed bridge work which acts in the same way.

In removable bridge work the abutments each get individual motion and exercise during brushing and massaging. The abutments also are reached with the silk by the patient, as they cannot be in any fixed appliance.

Fastening abutments together with wire (or otherwise) when they are intended for the support of a removable bridge, I believe to be entirely wrong in principle. Each abutment should be left standing alone. In discussing these splints and extraction somebody nearly always says, "If you don't put a fixed splint on these teeth how would you splint them?" and some one else says, "That this all sounds like wholesale extraction and bridge work instead of the saving of teeth."

Certainly I do not want to convey the idea that I believe in wholesale extraction; for saving teeth is my mission. On the contrary, I believe in retaining every tooth that can be kept in a healthy condition. But I hold that the greatest thought and object throughout should be permanency, and that we need the courage to advise and do the things that will result not in temporary alleviation, but those things that will mean the greatest ultimate good to the patient; and disregarding these things has done much to bring the treatment of Rigg's disease into disrepute.

Just here I wish especially to emphasize another point, which at first may seem opposed to what I have been insisting upon, and that is that the amount of alveolar bone and periodontal membrane remaining about a tooth does not always indicate whether that tooth should be retained or extracted. For

instance, sometimes a tooth with two-thirds of its alveolus in place will not make a good abutment, while again another tooth with only one-third, or even one-fourth of its alveolus remaining will make a useful and permanent abutment. Such teeth, if lateral strain is overcome, often do astonishingly well. Those with absorption evenly developed are much the more favorable.

I can only refer briefly to attachments. Attachments are best placed, so that the strain will not be on the side of abutments or exercise any tilting motion, either in mastication or in adjusting or removing the bridge, but so placed that the force will be directly downward in mastication, and directly down and up in taking the bridge out and replacing it.

When these are adjusted to the sides of bicuspid, and we have a saddle carrying the molars, we have a double evil; the saddle and the side attachment.

The saddles, of course, are unavoidable, but not so with the attachments. Where these teeth have much of the alveolar bone absorbed, this combination, as usually applied, proves fatal.

In adjusting saddles many little points are to be observed. The pressure should come back of the abutments—none at all very near them. This part near the abutment should be for the sole purpose of controlling the food by the tongue and cheek. These saddles should go as far back as possible.

Saddles should always be temporarily adjusted, so that when absorption of a ridge takes place they can be lowered from time to time as occasion requires, until absorption stops.

To depend on forcing a saddle to place while taking an impression—expecting this saddle to do its permanent work in that position is wrong in principle.

To argue that a saddle placed on the ridge between abutments exercises a beneficial influence on the mucous membrane and bone, stimulating circulation and acting beneficially to the near-by abutments, I also hold to be wrong in principle.

These saddles are often supported by bars connecting with the opposite side. What are called lingual and palatal bars, so far as I know, were first introduced into dentistry by Dr.

Victor H. Jackson, in the construction of his regulating appliances; and so far as I know they were first adapted to bridge work by your essayist.

These bars are exceedingly useful in their leverage power in overcoming lateral strain, thus increasing the efficiency and the life of these teeth. Suppose an upper case; alveolar bone largely gone from around all the teeth. On the one side we have lost the first molar, and, on the other side, all the teeth back of the first bicuspid. On the one side the molar and second bicuspid are crowned and a removable bridge of three teeth is made. On the other side we crown the first bicuspid and swing off a saddle carrying three teeth. The two sides are joined together with a palatal bar crossing the palate slightly in the rear of the second molar barely touching the mucous membrane. This bar is slightly oval in shape, and is made very rigid.

It requires quite a little study to realize just what this bar does. The three teeth on the saddle swung off the bicuspid you will readily see would, without the bar, quickly wrench this tooth from its socket, but with the bar this one tooth carries the bridge much better than if the first or second molar were in place and the bar not used.

Suppose we did not use the bar—remembering these teeth have only a part of their original alveolar support, we attach the bridge to two bicuspids or even to both bicuspids, the cuspid and lateral—four teeth. This bridge would not give anything like the service or be as permanent as with the bar and one abutment. It would cause the final loosening and loss of all these teeth. By careful adjustment, this piece does not interfere with the speech in this position, as does any piece of whatever shape placed further forward.

The lingual bars are made to come just clear of the mucous membrane and well below the gum margin of the inferior incisors. They are made thick and round at the bottom where they come in contact with the frænum, and thin at the top, thus causing the least interference with the tongue.

I first used these bars in the shape of a round iridio-platinum bar with fixed bridge work. One of these was adjusted

to a fixed bridge in the mouth of a patient here in New York City about fourteen years ago. This bar was placed too near the soft tissues below the inferior incisors, and caused so much trouble that it had to be removed.

The mortification from the failure of this bridge was one of the things that led me to work out a system of removable bridges for these cases. At this time I held all removable appliances to be injurious—and I still hold the same opinion so far as all of those of which I then knew are concerned; but now I believe very few cases should have anything but a removable appliance.

After their adjustment, the mouth should, of course, have the strictest prophylactic care by the patient and dentist and a normal healthful way of living encouraged. What an object lesson the mouth showed us by Dr. Hyatt and Dr. Dunning should be to us! What a dreadful condition—and that child only fourteen years old! Who could look at that mouth and hold to the purely local theory!

I believe the time is not far distant when the condition of the mouth will be a chief diagnostic symptom for the physician to treat the system for the chronic systemic trouble which caused this chronic mouth trouble. And the operator who really treats Rigg's disease successfully must understand systemic conditions, so that he may be prepared to co-operate with the various specialists in medicine and do it intelligently.

To sum up some important points on which I have been both misunderstood and misquoted:

1. I believe in splints, but removable splints.
2. I believe in cutting off teeth, leaving only the root, but only when they cannot be saved otherwise, or when this is indicated for the support of a bridge.
3. I believe in removing the infected and hypercalcified parts of the cementum, but not depending on this for a cure.
4. I believe in extraction, but only such teeth as promise not to be permanent, or such as do promise to cause an inflammatory condition.
5. I believe in saddles, but only when unavoidable, and

only with the seat of pressure well removed from the abutments, and made so as to change as absorption takes place.

6. I believe in retaining teeth almost in the last stages, but only in connection with a bridge and when, after cutting off, and treating we find they properly respond to treatment.

7. I believe in discarding the name of pyorrhea alveolaris, but not in permanently adopting the name of Rigg's disease.

And now in conclusion please let me add that in the essayist's humble opinion at some time in the future we will realize that the chief and most important office of those who deal with Rigg's disease conditions is not so much to be able to treat the local conditions; not so much to understand all the underlying principles governing the preparation for bridge work; not so much the construction and application of the bridge work itself; not so much the constant after-prophylactic treatment; not so much any or all of these things; but our one great office will be to impress on the patient the importance of right living, so that he may, as far as he can, ward off the systemic condition which brought the trouble about and which tends ever to its recurrence; and so that we may be able to obtain, in so far as is possible, permanent results.

**PRACTICAL METHODS OF TEACHING CROWN AND
BRIDGE WORK—AS ADOPTED BY THE
HARVARD DENTAL SCHOOL ¹**

BY JULIUS F. HOVESTADT, D.M.D., BOSTON, MASS.

All of you who have gone through the new Harvard Dental School Building must feel inspired and stimulated by seeing what has been accomplished by the earnest work of the capable men who outlined and superintended the work. And as this new building is so different from the old dental school building at North Grove Street, so also are the methods of teaching in the various departments different from those of former years.

It gives me great pleasure to show you to-day some of our methods of teaching crown and bridge work at the Harvard Dental School. It is no easy task to select the work which is most valuable for the student to know—and next, to find ways and methods of teaching this work in the most direct and positive way.

A committee was appointed, composed of men from the Crown and Bridge and Prosthetic Department, and they decided upon a list of crowns and bridges that seemed most suitable to be taught for the year 1912-1913, and it was agreed that no other work should be undertaken during this season unless necessity should arise.

After this a schedule was established, which explained every step to be taken by the student in the technique of these crowns, inlay-abutments and bridges.

Each student is required to obtain this schedule, and to use it for guidance in his daily work at the school.

To simplify the carrying out of this work still more, specimen cases of these specified crowns and bridges, in step form, such as the schedule describes, are made in German silver, fitted to porcelain technique teeth. The various steps of this work are mounted and shown in small boxes, and are kept

¹ Read before the 49th Annual Meeting of the Massachusetts Dental Society, May 8-9-10, 1913.

on daily exhibit in the Prosthetic Department. This work is done for the purpose of aiding the inexperienced dental student to form a mental picture of the work outlined in the schedule.

With this specimen work, showing all the various steps from the first up to the finished crown or bridge, the student can form a clear idea of what is wanted, and carry out the work in a precise manner.

With this schedule and specimen work complete, you may think that it is easy sailing for the teachers, the students, and the patients at the school; but our greatest trouble at the school has not been with the students, nor with the patients, but with the teachers, and I have found that to be the case in other dental schools.

I do not wish to say that our teachers were incompetent, or that there was a lack of interest in teaching—not by any means. It was simply the lack of a uniform system by which to teach.

Too often the teacher was carried away by his eagerness to help the student, in showing and helping him to undo work, where it would have been better to let the student start all over again. We all have done this no doubt, especially when a student has failed two, three, or more times, and the patient is getting uneasy—we feel tempted to help out in our way, just to get through with the particular case.

We all have certain ways of working, individual ideas, and short steps that we find valuable in our private practice, and with them we want to help out. But these individual ideas of the teachers have been stumbling blocks many times, at least in the crown and bridge or prosthetic department.

Teaching crown and bridge work should be done by the adopted system of the school, not by individual ideas and “ways” of the teachers. It is an old trick, practised by some of the students in all schools, to go from one teacher to the other, and find out from these men which is the easiest and quickest way to make such and such a crown, or bridge, or whatever they want to know; with the result, that by the time the student has all the information, and the various ideas,

and short steps from the different teachers, he does not know which to follow—and we all know what usually happens to such a piece of work.

It is too bad that the students do this, but there are always certain men who think it is a waste of time to follow the details so closely. To overcome this great trouble, an evening course for the teachers of the Operative and Prosthetic Departments in crown and bridge work was decided upon and carried out. In this evening course all the teachers got thoroughly familiar with every detail of the schedule.

It was agreed that a tooth for certain crowns must be trimmed in a certain way, as outlined by the schedule and the specimen work; that inlays to be used as bridge abutments, the making of a sanitary or porcelain bridge, or any other work, must follow strictly the plan given in the schedule. Furthermore, practical demonstrations of all the specimen work were given in this evening course.

For example, Schedule No. 5 explains the making of a cap and post for a Richmond crown. It therein states distinctly how to take a wire measurement, and from this how to cut the gold strip; it tells the karat, the gauge, the width; the alloy of the gold plate to be used; how to produce a good joint; how to solder same with the right karat of solder. It further shows how to put on the top, what karat gold plate solder to use, how to proceed to put in the post, etc.

It is needless to say that we, the teachers, had many pleasant arguments for and against certain methods, in this evening course, but finally we were all satisfied, and indeed happy, that we had at last an established schedule of methods to go by. This schedule has proven of great value. It saves the teachers much time explaining the same thing over again, and whenever a student now comes to one or the other teacher, asking how he is to proceed with his work, he gets from one and all the teachers the same answer, "Look up your schedule and follow it closely."

This schedule is used by the Junior Class for the construction of the junior specimen work, and by the Senior Class to carry out the practical work for the patients of the school.

It is the intention of the school to keep step with progress in all good things, and in the schedule for the coming year we will have many valuable additions and improvements.

Now, having described some of the work that we do in the Crown and Bridge Department, it may be of interest for you to know just how our department is conducted.

The course consists of lectures and clinics. The former are given once in two weeks, the latter every Monday morning.

When a patient comes for crown or bridge work, he is received by the doctor in charge of the Operative Department. He assigns this patient to a student. The demonstrator or head of the five section instructors examines the patient in the presence of the student and his section instructor. He then decides and outlines to the student and section instructor what work there is to be done. In some cases an X-ray has to be taken. The patient is at once taken to the X-ray room, where the doctor in charge attends to him. If teeth, roots, or pulps have to be extracted, they are referred to the doctor in charge of that work, and he takes the patient into a special room fitted up for local anesthesia, and here gives the student instructions in the different methods of injections with novocain. He also attends to all cases of sensitive dentin, of the removal of pulps, etc.

The injection of novocain is made in the small room mentioned, and afterward the patient is brought back to the student's chair, the student then having from one hour to one hour and a half anesthesia to do his work, such as trimming the teeth, fitting bands, etc., without causing any pain to the patient.

To show the value of the X-ray and the novocain, one interesting case may here be mentioned.

A patient wanted a bridge extending from the second upper molar to the first bicuspid. Some trouble started of obscure cause. An X-ray was taken, which showed a newly erupting third molar below the second molar, causing absorption of the roots of the latter. An injection was made, and the second molar removed. The crown of the third molar was

now in clear view, on account of the anemic condition, caused by the injection.

It was easy to determine that the third molar would not erupt in straight line, and therefore would be of no use later as an abutment for a bridge. Under the primary local anesthesia this tooth was removed also, which showed the fact that the roots of the second molar had been fused together with the third molar. We find the X-ray of great value in locating trouble and in showing the position of the roots before going ahead with the work of crowning.

The local anesthesia, which does away with all the painful work, has proven a great success for our Crown and Bridge Department, and I have noticed a great increase of patients since we used this at the school. And why should it not be so? It makes no difference whether rich or poor, the patients fear the pain more than anything else, and if that is eliminated, they are more willing to have their teeth put in proper condition.

My last model shows two cases that we have just finished at the school—the first rather unusual, on account of so many missing teeth.

The patient is about nineteen years of age.

Model 1, also X-ray of teeth.

As shown, only the four first molars and the upper central incisors were permanent teeth. The centrals were put in proper position, the bridges with porcelain facings in front, and Goslee teeth on the sides were used to fill in the spaces. The patient, a rather pretty young lady, is much pleased with the improved appearance, and, most important of all, she can now masticate and enjoy her food.

The other model shows the fine work done in our Orthodontia Department, and the case was referred to our department to fill the spaces with bridges.

The lower shows a sanitary bridge.

For the upper we made an all-metal molar crown, a bicuspid staple crown, and filled the space with two bicuspid Steele posteriors, the upper bridge showing no gold.

Many cases that come to the school for treatment of pyor-

rhea alveolaris are greatly benefited by staple or removable bridges. Many bridges act as splints, to hold the loose teeth firmly in their position; I believe that a specialist in pyorrhea alveolaris must be also a crown and bridge expert to obtain the best results in the saving of loose teeth.

Our Prosthetic Department, with its splendid equipment and competent teachers, offers the student every possible advantage.

The junior student makes ten specimen crowns and six specimen bridges.

Our seniors last year gave service to patients to the extent of

207 crowns and caps.

41 crown repairs.

109 pieces of bridge work.

17 bridges repaired.

Total of 374 pieces by a graduating class of twenty-three.

REPORTS OF SOCIETY MEETINGS

FIRST DISTRICT DENTAL SOCIETY, STATE OF NEW YORK

October 6, 1913.

A regular meeting of the First District Dental Society, S. N. Y., was held at the Academy of Medicine, 17 West Forty-third Street, New York City, on Monday evening, October 6, 1913.

The president, Dr. Henry W. Gillett, occupied the chair, and called the meeting to order.

The address of the evening was made by Professor William J. Gies, of Columbia University, in reporting the researches on dental caries, which were carried out during the past year by himself, with the assistance of Dr. Alfred P. Lothrop.¹

Discussion of Prof. Gies's Address.

Dr. Arthur H. Merritt—On June 2 Dr. Lothrop came to my office with several teeth which had been filled and a letter from Professor Gies, which reads as follows:

"Dr. J. Morgan Howe, at our request, has sent us some *filled* teeth for use in our work throughout June in particular, and for the rest of the summer in general, in final preparation for our reports next October. We are going to determine the corrosive action, if any, of acid, alkaline, and neutral physiological media on the fillings *and at their edges*, with a view to settling certain questions pertaining to the effects of saliva, mouth washes, etc.

"I am asking Dr. Lothrop to see you about making a detailed examination of a few of the available teeth, as the dental expert in the case. We must note *very carefully* the exact condition of the *fillings along their edges*, and the exact condition of the *enamel along the edges of the fillings*. Will you kindly determine therefore, with the aid of your sharpest instruments, whether there are any defects whatever at any point, *on the*

¹ See report in full at page 283 of the present issue of THE JOURNAL.

edges, in both the filling and enamel of each tooth. I would suggest that you prepare an identification memorandum for each filling, and that you record, in connection with it, such comment as your special examination warrants, the said comment to be given to us as your report to be incorporated into ours over your signature. At the end of our treatment we shall request you to repeat the examination in the same detailed way to determine, in doubtful cases particularly, whether our treatment has induced any alteration of any kind. I would also suggest that you invite an associate to make a similar examination, so that your own deductions may be fully supported against any criticism later—the same associate, if possible, to co-operate with you in the examinations at the conclusion of our treatments.”

These examinations I made at that time. Dr. Lothrop had with him these teeth, then unmounted, which contained cast gold inlays, malletted gold fillings, amalgam, gutta-percha, oxy-phosphate of zinc and silicate cement. These fillings I examined, not only with my “sharpest instruments,” but with a strong magnifying glass. I found that the plastic fillings were as perfect as one would expect to find them in any case. The malletted gold filling was decidedly imperfect at its edges. It was a gold filling on the buccal surface of a molar. The cast gold inlay was decidedly imperfect at the cervico-buccal margin. There was a considerable excess of cement around the edges of the filling. I made a note of these teeth with their fillings, and returned them to Dr. Lothrop. On October 4 they were again submitted to me for further examination with this letter from Professor Gies:

“Dr. Lothrop will return to you for examination, the filled teeth which we have been treating since their presentation to us. Please record your observations without informing either Dr. Lothrop or myself of your findings, so that we may make our statements on Monday, regarding treatment, without any knowledge of your opinions, and you, in turn, can present either orally, or by written report, your opinions without any knowledge of our treatment of the teeth. This is the method we employ in many relations in order to make the conclusions all the more reliable.”

This examination I made as carefully as I could on Saturday. There was no evidence after the most careful examination that the enamel on any of the teeth had been affected in any way. The gutta-percha filling, the amalgam filling, the silicate cement filling—in fact the gold fillings themselves had not been affected in any way. The oxy-phosphate of zinc filling, on the occlusal surface of a molar, was very considerably washed out—it seemed to me nearly fifty per cent. A very considerable amount had certainly disappeared since my examination three months' earlier.

The weak point in the cast gold inlay was submerged in the paraffine, and therefore not subject to the experiment. All the cement around the gold inlay, which was very noticeable in June, had practically disappeared.

I saw no evidence that there was any deterioration around any of these fillings, and so far as my observation went, the teeth had not in any sense, either around the edges of the fillings, or the fillings themselves, been injured by the experiments. (See pages 306 and 377.)

Dr. Linton—When Professor Gies first requested these teeth, I sent him a number, which were decayed around the fillings. He returned them, and said they were not what he wanted; he wanted perfectly filled teeth. I supposed he was going to try to show that we dentists did not make perfect fillings. I inserted a temporary tooth, and expected to see it come back all decalcified. But as far as I can see these teeth are just as good, if not in better condition than they were when I sent them to him—that is, he seems to have put a polish on the enamel that was not there when I gave them to him. They are old teeth that I obtained from Dr. Hasbrouck. (See pages 306 and 376.)

President Gillett—On two or three cases we have a report from Dr. Karl Smith, who is unable to be here, but which the secretary will read.

Dr. Karl C. Smith—As an aid to prophylaxis I consider the use of vinegar, or other fruit acid, exceedingly useful, and will briefly state the clinical experience of three typical cases, selected because of their conscientious home treatment.

Case No. 1 is of especial interest because of the long

standing treatment, about three years, and consequent fine opportunity for observation of results. The patient is one of weak constitution, is now in the twenties, and has been under my care from early childhood. The case up to three years ago has been one of those hopeless ones in which the teeth fairly melted away on all sides, regardless of all efforts at preservation. Saliva-alkaline in reaction. Being present when Dr. Gies first threw out the suggestion of possible benefit from the use of weak fruit acid, I jumped at it, as a drowning man at a straw, and immediately began the use of vinegar—15 per cent. solution—with this patient. The good general effect was apparent almost immediately, and has continued, and for one and a half years the mouth has been no more than ordinarily susceptible to caries.

Case No. 2 is that of a child wearing regulating apparatus. Saliva thick, ropy, and very plentiful. Teeth, appliances, and lips covered with a dark sticky substance, and mouth generally defying efforts at cleanliness. Vinegar prescribed and condition entirely changed within three weeks.

Case No. 3 is that of a physician of sixty-three suffering from pyorrhea. Mouth condition much the same as in case No. 2. Vinegar prescribed with good results beyond question.

None of the above patients has found the treatment disagreeable, but the contrary, and each would as soon forget the brush as the vinegar, patient No. 1 having carried a supply with her all over Europe.

No bad results are apparent in any of the above cases.

Dr. N. T. Shields—I think this is very largely a matter of the alkalinity of the saliva. If a person has saliva not normally alkaline, I do not believe that vinegar or any other tooth preparation will prevent his teeth from decaying. If a person has normal saliva, you can scarcely make teeth decay; this condition, which has occupied a very little part of this paper, is in my mind a very important factor. Thorough prophylaxis and health is the keynote. With thorough prophylaxis and normal saliva, people have very little to fear from decay. This all of us know from long clinical experience.

In none of these experiments has the essayist had any possibility of the lodgment of food around these teeth. In the human mouth food is present, and with the most careful prophylaxis scarcely any of us remove all particles of food. Should we be able with toothpicks, floss silk and toothbrush to clean the teeth, the normal saliva will do the balance. A mouth wash which will be most effective in the cleanliness of the teeth will all the better enable the saliva to do its work.

The suggestion to put a certain number of children under the care of an institution where a number will use a diet of fruits, and the others use all kinds of chocolate desserts, etc., would be absolutely a fair illustration, provided the teeth of both are thoroughly cleaned.

We have a daily secretion of a quart to three pints of saliva. The calcic substances of the saliva are held in solution by the presence of a sufficient quantity of carbon dioxide (CO_2). This combination, however, is so unstable, that as soon as the saliva is exposed to the oxygen of the atmosphere or to the acids of fermentation produced in the mouth, or is at rest, the carbon dioxide escapes, and the calcic elements, being no longer able to maintain solubility, are precipitated. This is the natural condition without the addition of any fruit acid. No fruit acid in a mouth wash will be harmful, and no fruit acid will save the teeth. The addition of fruit acids will doubtless clean the teeth more quickly, but do not make the mistake of thinking the fruit acid will save the teeth. The normal tooth structure is maintained by alkaline saliva.

Dr. C. F. MacDonald, Jr.—When Dr. Gies a few years ago hinted at the possibility of using an acid, such as dilute acetic, for a mouth wash, the idea struck me personally as being worthy of careful consideration. My attitude was based on, perhaps, a fanciful and I must admit not exactly scientific observation, that being the common experience we all have of "the mouth watering," to use a layman's expression, when we taste or even see lemons, pickles, limes, etc. What could be more natural than the production in the mouth cavity of an alkaline condition by the stimulation of the flow of an alkaline saliva? I still believe there are a lot of things about the saliva of

which we are not yet fully cognizant, and that normal alkaline saliva has more value in the preservation of the teeth, and is of greater assistance in the prevention of tooth decay than has generally been recognized. An acid mouth wash would seem to be a physiological method, not only of stimulating the flow of saliva, but indirectly of creating an alkaline condition of the oral cavity. Alkaline mouth washes I have always felt to be an artificial method of trying to bring about a condition which nature has provided for and which she can look out for herself. In the long run we cannot do any better than nature, but we can often materially assist her.

Apart from this aspect of the question, the recent work upon the mucous plaques and the continued enlightenment we are getting upon mucus, has given us facts which must be considered in determining upon a mouth wash.

Disintegration or freeing of this slimy, tenacious plaque from the tooth surface seems imperative if the beginnings of caries are to be prevented, and it is here that the advocates of the acid mouth wash have presented the best evidence for its use. We know the action of dilute acid solutions upon mucus in the laboratory and something of the probable effects upon the mucus collections on the tooth surfaces, and when compared with the actions of alkaline solutions, this new recommendation begins to assume a greater significance.

It seems as though we are facing a new era in the knowledge and application of suitable mouth washes, and that in the near future the alkaline mouth preparations, liquids, pastes, and powders, are to be laid upon the dusty shelf of an unscientific past.

As to the pastes and powders, I have felt for some time that under certain conditions, these were a source of danger, due to the insoluble base, which, ever so finely ground, might lodge beneath the gum margins, creating a local irritation and becoming the centre for deposits of calculus and the usual debris of these cases. I was most happy to learn that Dr. Pickerill likewise held this view of the matter.

For the past few years, in those cases where rapid accumulation of tartar had been observed, and in all cases of pyor-

rhea or interstitial gingivitis, I have told the patients to lay aside tooth pastes and powders, and then, after being sure they understood how to properly brush their teeth, have had them use soap and a stiff brush. Their conditions have never become worse under this method, and I feel that time will show an improvement.

With a solution which will act to disintegrate and free these sticky mucous accumulations, a stiff brush, properly manipulated, should prove quite sufficient to mechanically cleanse the teeth without resorting to an insoluble abrasive.

Dr. Gies has given us data upon which to construct a solution of this character, but I feel that here again only a beginning has been made, and that some experimenting is still necessary to determine upon the best preparation. Personally, I have great faith in the acid mouth wash, and also the courage of my convictions, but feel that before giving the matter an extensive clinical trial, a little more laboratory data relative to various kinds of acids and acid salts in their action upon mucus, under different strengths of solutions, various combinations, etc., might prove of help in producing an efficient mouth preparation.

By an efficient preparation I mean one which will do the work of disintegration best and yet be as pleasant to use as possible. Our patients may not be readily converted to this new propaganda, and perhaps some of the men here who have tried the acids as suggested may appreciate the patient's unwillingness to change from the old standbys. Unfortunately we must cater to the whims, tastes, likes, and dislikes of our patients to a certain extent and to begin them on repugnant preparations might not be diplomatic. Combinations less disagreeable than the ones now suggested may be possible. I may say that at this present time H. Carleton Smith, of the Harvard Dental School, and myself are working along the lines of acid mouth preparations, but as yet have nothing definite to offer. Being really a stranger in a strange city this last year has prevented me from doing a few little things along these lines that I should have liked to have done.

I have enjoyed Dr. Gies's paper very much, and, as I have

said, relative to the acid mouth wash, have the courage of my convictions and shall in the immediate future make some clinical experiments and observations—in fact, I have two cases at present which seem ideal for the proper testing of this theory.

I hope at a future meeting to learn that many of those here to-night have tried the suggestions of Dr. Gies—he should have encouragement and practical support—and I feel that many instructive and interesting cases will be reported as the result.

Dr. J. Grant Pease—Last year I was an interested listener to Professor Gies's report, and accepted it as common sense and rational, and in discussing the paper I stated that I would try the use of dilute fruit or "fruit acid" in my practice.

My first step was to secure a supply of apple cider vinegar and a copy of Dr. Pickerill's book, "Prevention of Dental Caries and Oral Sepsis." I must say that vinegar has always been distasteful to me, and I, therefore, found its use very unpleasant.

As Dr. Gies has stated, care should be exercised to employ only the pure, unadulterated apple cider vinegar, properly diluted. However, my personal and professional experience indicates that this material is not acceptable for general use; a few of my patients used it willingly, but the majority objected to it very much.

On page 229, "Prevention of Dental Caries," Dr. Pickerill gives four formulas designated by the letters A, B, C and D, and on the following page he gives the alkalinity index for each. The formula indicated by the letter "D" is shown to stimulate a greater amount of saliva, and within five minutes a resulting alkalinity stronger than either of the other three.

I called on Dr. Gies one day, had a very pleasant talk with him on Pickerill's formula, and he was certainly most genial toward Dr. Pickerill.

As a result of my conversation with Dr. Gies, I employed a druggist to put up an eight-ounce quantity of the "D" formula, the active basis of which is one grain of tartaric acid and two grains of potassium bitartrate to one ounce of

water. I, however, believe that the pleasant flavor due to the lemon oil and saccharin has something to do with stimulating a normal secretion of saliva.

This eight ounces cost me 35 cents, and lasted two days. This prohibits it for general use. Besides, the oil of lemon soon decomposes into a turpentine compound.

It appealed to me that there should be something, at once effective, pleasant to the taste, neat in appearance, portable and of known purity; and withal under a constant supervision as to clinical results.

I, therefore, started on the hypothesis that Pickerill's "D" formula was effective. The proof of this and the other qualifications I must work out.

In order to obtain stability of compound and portability, I used the terpeneless oil, which is twenty times stronger than the ordinary, and requires only one-twentieth for the same flavor. The use of this results in a dry powder, which is very portable, can be quickly measured and dissolved in water.

Since last October I have been using Pickerill's formula in one form or the other, five and more times a day, often demonstrating its use to patients, at all times with the use of the toothbrush.

Last Thursday, I called on Dr. R. G. Hutchinson, Jr., who several years ago saved me from pyorrhea. I had had no attention for five months. Upon making an examination, he said: "Pease, I have never seen your gums in such healthy condition." He gave me a prophylactic treatment, and said there were no encrustations to be removed.

Notwithstanding the frequent daily use of the brush and fruit acid my teeth are in perfect condition.

I would not say that such frequent brushing of the teeth would be advisable in all cases, or that dilute fruit acid is a panacea for all our dental ills. But my experiences and those of patients, who have not used it so long, cause me to be sanguine. Another year will tell more.

Dr. Zentler—Three years ago, when Dr. Gies suggested the use of vinegar, it came to my mind that during the summer I had noticed that patients treated for rheumatic condi-

tions have been advised to take a glass of unsweetened lemonade one hour after meals. I had seen these patients, and had noticed that their mouths were unusually clean. It did not impress me then, but when Dr. Gies suggested vinegar, this came to my mind.

I have used it in my own mouth for three years. I have also taken in my practice some patients where I thought it could best be illustrated, where the caries was very pronounced, explaining to them the possible danger. I will quickly read the reports of some cases which were very interesting:

I. R. J., female, came under my care in 1907, being at that time twenty-four years old, and was regularly under my observation twice yearly. Until 1911 she was using at various times various of the known dentifrices on the market, taking what is known to be good care of her teeth. In the period of time from 1907 to 1911 I was compelled to do twenty-two dental operations in her mouth, which already had a large amount of such operations, done previously to her becoming my patient.

Her general health was never of the best, and she suffered with hyperacidity of the stomach. Close examination of the cervico-labial surfaces of her teeth showed no indications of erosions, except perhaps on the lower left lateral which had a porcelain inlay, and which cavity, before being filled, might have originated in an erosion. The surfaces of her teeth presented at all times, even the day following a very thorough treatment with the orange wood stick and pumice, that well-known slimy appearance found in the mouths of frequent tooth decay, technically known as a mucin covering.

In February of 1911 I advised this patient to discontinue all other dentifrices, and use exclusively a fruit acid mouth wash twice daily; evenings the last thing before retiring and mornings before breakfast. In May, 1911, she reported that since using the vinegar diluted in water, instead of any other mouth wash, she had such a feeling of cleanliness in her mouth as she had never experienced before. An examination of her teeth at that time revealed two suspicious points which

were not filled but made note of. No progress of these suspicious points has been noticed during her subsequent visits up to the present time, and during 1911, 1912, and 1913 no new dental operations were performed, the only thing done in the patient's mouth, aside of scaling and polishing teeth, being the replacing of some old defective amalgam fillings with gold inlays, making the dental operations during these three years altogether five, as against twenty-two during the four years previous to 1911.

No traces of erosions or any other kind of chemical dissolution of the enamel was noticed in this patient's mouth during these almost three years of use of the food acid mouth wash.

II. J. K., female, came under my care in 1906, being at that time eighteen years old, and has been regularly under my observation since. She had a large number of fillings in her mouth previously to coming under my care, and in spite of frequent visits to my office, and good care taken of her teeth by herself, eighteen dental operations were needed in her mouth, until the beginning of 1911, when I advised this patient to use fruit acid mouth wash twice daily, to the exclusion of all other dentifrices. This advice was given reluctantly in this instance because of traces of erosions noticed on all four cuspids, and the uncertainty as to how the regular use of the acid may affect such predisposition. In the June of 1911 the patient reported an especially "healthy feeling" in her mouth, and no new dental operation was performed; two old amalgam fillings being replaced with gold inlays. No dental operations, aside of scaling and polishing, were done during the remainder of 1911 and 1912, during the summer of which year the patient being warned, by what she considered a very good physician, of the danger of using acid as a regular mouth wash, discontinued its use, and upon reporting in the fall of 1913 four new dental operations were needed. No visible increase in the previously noted erosions can be noticed, and no other erosions are present.

The general health of this patient was never good; she was more or less under constant care of her physician for what she called "indigestion."

III. S. H., male, came under my care in 1906, being at that time thirty-five years old, and has been regularly under my observation since then, needing altogether during all these years eight dental operations. He had only three fillings in his mouth previous to coming under my care. He reports that he has never used any dentifrices, only the tooth brush with water, but that since he can remember he was in the habit of eating one or two apples before retiring, and that he seldom finished a meal without eating some fruit. His general health as reported by him is good. On the other side the very irregular and crowded condition of his teeth, and the lack of more than very ordinary care given by himself to his teeth, would be reason to expect a greater predisposition to tooth decay in his mouth, and who knows whether the use of food acid, in this indirect way, I mean the regular and frequent eating of fruit, has not had its prophylactic influence in this instance? No traces of erosions are noticed on the teeth of this patient.

Dr. Gies (closing the discussion)—I am very glad to say that our own independent findings (on the basis of very careful topographical records that were shown) agree perfectly with those reported by Drs. Merritt and Linton, except in one respect: the oxy-phosphate of zinc filling to which Dr. Merritt referred as "very considerably washed out," seems to me to be as it was from the beginning. I am under the impression that the small quantity of filling material in the grooves radiating from the depression occupied by the filling was there as overflow matter from the start. I have myself attended to the daily brushing of these teeth since June 30, so that possibly I have not been appreciative of slow but material alterations. Certainly I would not wish to suggest that this impression of mine amounts to anything against Dr. Merritt's professional judgment.

It is very agreeable to hear favorable reports such as Drs. Smith and Zentler have presented. Let me assure you, however, of the very great desirability of your presenting *unfavorable* clinical findings. The most important facts in this connection, from now on, are those which would not support the general theory on which my proposal of the food-acid

treatment is based. If I were told that every man and woman present to-night is going to proceed to do his and her best to *find facts* that will promptly drop the bottom out of this notion of mine, I should be perfectly happy. I hope you will come to the next annual meeting prepared to show me the "finish" of this "revolutionary," "radical" and "surprising" doctrine.

I note with special interest Dr. MacDonald's remark to the effect that the disintegration and removal of mucin smears and plaques are essential for the prevention of caries, and also that it is on this point that the advocates of the use of food-acid media as mouth washes have presented the best evidence in support of such employment. It is at this particular point that Pickerill's and my own recommendations differ both in basis and import. (See page 319.)

Dr. MacDonald's remark to the effect that we have provided data upon which to prepare an effective acid-dentifrice reminds me of my suggestions at previous meetings that you *work out details clinically* along as many lines as possible. A year ago I said: "Use diluted vinegar, or fruit juices—'straight' or diluted—or acid potassium tartrate or carbonated water, or any similar 'natural' acid medium of a slight *degree* of acidity. Test the matter thoroughly. Determine quantities, number of application, etc., for yourselves on a rational basis. Make many tests. Report your results in dental journals. 'Get busy' on this line, and keep at it until we know whether the proposed treatment is valuable or not. How can you imagine there is any danger in it? If it fails to do good, it surely cannot do harm. Few therapeutic measures offer that happy alternative. It would be a serious reflection on the scientific spirit of your society if, after ignoring my very simple suggestion for three years, the proof of the utility of the proposed treatment should be presented by others—although, of course, you and I would rejoice just the same."²

Thus far in our study of fundamentals, I have been concerned wholly with the *principles* involved—details can be determined easily enough after the principles are clearly distin-

² Gies: *Journal of the Allied Dental Societies*, 1912, vii., p. 481.

guished. Dr. MacDonald says, truly enough, that "combinations less disagreeable than the ones now suggested may be possible." Most assuredly! Even vinegar can be given any common flavor (that is not added in an alkaline carrier), to the entire submergence of any unpleasant taste, *without diminishing the vinegar's acidity or its value for the recommended purpose*. Although this is so obvious that it has not seemed to require discussion, I now feel called upon formally to state it, especially because of what Dr. Pease has just said about his helplessness when dealing with vinegar and about his reasons for endeavoring to find an artificially, and more agreeably, flavored substitute. This fact, the easy submergence of one flavor by another, is particularly true of any *diluted* food-acid medium.

Let me add, in conclusion, that although you and we are anxious to go forward rapidly, we must proceed wisely; speed of progress must be sacrificed to thoroughness of understanding. There will be no "revisions downward," if we can prevent them. Assuming that the proposed use of food-acid media is helpful, it is obviously desirable that the *best* medium be publicly designated promptly. This stands to reason; and we hope to do so, as soon as it is possible *scientifically* and clinically to state to you our conclusions. With your encouragement, through observations and reports on the effects of the different media, of your own selection as well as ours, we shall be able, at an early date, to arrive together at the goal. Your individual coöperation to this end is cordially invited.

* * * *

Unavoidable delay in the correction of the printer's proof of this discussion enables the speaker to add to the foregoing reports by Drs. C. C. Linton and A. H. Merritt, the following notes, dated Dec. 2 and 3, respectively, that refer to the two sets of teeth, discussed by them on pp. 363-5, which have been subjected continuously since Oct. 6, to the treatments described by Lothrop and Gies on page 304.

"The teeth do not appear to have undergone any change since I last examined them, October 6." *Charles C. Linton*. (Dec. 2.)

"I have this day (Dec. 3) made another examination of the specimen teeth with fillings, used in your experiments, with the following results: All enamel surfaces and the edges of all fillings are in excellent condition. I am unable to see that any changes whatever have taken place as a result of the experiments to which they have been submitted. This is also true of all the fillings, except the oxy-phosphate of zinc cement, which has nearly disappeared, there being less of it than at the examination in October. This is probably due in part to the abrasive action of the brush and partly to the solvent action of acids. All overflow about the gold inlay has disappeared, but without in any way injuring the filling as far as I can observe." *Arthur H. Merritt.* (Dec. 3.)

**FIRST DISTRICT DENTAL SOCIETY, STATE OF
NEW YORK**

November 3, 1913.

A regular meeting of the First District Dental Society of the State of New York was held at the Academy of Medicine, 17 West Forty-third Street, New York City, on Monday evening, November 3, 1913.

President Henry W. Gillett occupied the chair, and called the meeting to order.

The paper of the evening was read by Dr. Howard T. Stewart, of New York City, entitled "Relation of Rigg's Disease and Removable Bridge Work."¹

Discussion on Dr. Stewart's Paper.

(Remarks at the opening of paper.)

Dr. Stewart—When I was asked to read a paper before you to-night on the subject of pyorrhea alveolaris and its relation to bridge work, and when I inadvertently referred to the trouble by the name of Rigg's disease, a friend of mine, suspecting I am sure, that I was from the rural districts, said: "Now whatever you may call this down in your country, in New York you must call it pyorrhea alveolaris." So many men have asked us to adopt so many different names for these conditions that I am reminded of the old man who had contentedly enjoyed his religion until some fellow came along, and said: "Old man, there's a newer and a better creed; your religion was all right for the past generation, but you had better investigate the new one." He began to investigate, and the more creeds that he inquired into, the more he found there were to be investigated, until finally in his confusion he said he was going to stay right where he was until somebody agreed with somebody else as to just what was the right creed.

I composed the head lines of my paper so that they might be sent out to you some time before I began the preparation of the paper itself. I found it so easy to write outlines, but when

¹ See Dr. Stewart's paper in full at p. 345.

I commenced to write the paper to make it conform to these outlines, I came to the conclusion that it would be necessary for you to allow me to give it to you in annual installments. When Dr. Ottolengui received the announcement of this meeting containing the outlines of my paper, he said he thought I was going to read a book. Dr. Chayes said he thought he was getting an index to the American system of dentistry. He said he felt sorry for me, and he hoped I would come out better than he thought I would, but that he did not think there would be much left of me when they got through with me. Now, all this was very encouraging. This reminded me of another encouraging friend of mine down South, who, when he found I was going to New York, said: "You had better stay at home; New York is no place for you." But when he found I was determined to go, he said: "Well, go ahead; it will be a good lesson for you." I told him that the "lesson" did not appeal to me.

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Dr. Arthur H. Merritt—It is always unfortunate in the discussion of scientific subjects, where accuracy is of the first importance, that there should not be a common nomenclature. No matter what the subject is that is under consideration, if terms and names are employed, which are not in general use, it tends to confusion, and defeats every effort at accuracy.

It is true that the term *pyorrhea alveolaris* as descriptive of a disease characterized by a breaking down of the alveolar bone, is not all that could be desired; but it is in more general use than any other, it is, in part at least, descriptive of its pathology and anatomical location. This is certainly more than can be said of the term, "Rigg's Disease," which is inaccurate, meaningless and fast becoming obsolete. The whole tendency of modern science, and especially as it applies to general medical science, is to get away from names whose only excuse for existence is that the author may at some time have been identified with the study of the subject in question. Any attempt at this time to resurrect and perpetuate in our literature the term "Rigg's Disease" is, I believe unfortunate; and I sincerely hope that Dr. Stewart will consent to its withdrawal from his paper before it is published. Person-

ally, I do not think he is as wedded to the term as he would have us believe.

No one could have given any study to the subject under consideration without having been profoundly impressed with the problem involved in prosthetic restorations in pyorrheal cases, and nowhere in the whole realm of dental practice is the exercise of discriminating judgment of more importance.

Each case must be studied by itself, and there should be the closest co-operation between the man who treats the pyorrheal condition, and he who makes the restorations. Fortunately, there are many cases where artificial substitutes can be avoided, or at least deferred, and this I believe should be done wherever it is possible. When this is not possible, the artificial substitutes should be made in such a way as not to irritate the remaining teeth.

On this point I think the suggestions made by Dr. Stewart are excellent, and should be heeded by those treating these cases prosthetically. The routine construction of plates, fixed and removable bridges has no place in the treatment of pyorrheal cases. Success is dependent upon conditions altogether absent in ordinary cases of oral prosthesis.

I am inclined to believe that the statement that "every tooth should be extracted that does not promise permanency" should be modified. I have seen many cases where it was self-evident that certain teeth could not be restored to their former usefulness, but the saving of which made artificial substitutes unnecessary, or at least deferred indefinitely such treatment, and the patient made very comfortable indeed. This I am inclined to believe is good practice where the flow of pus from around such teeth can be stopped, and the teeth are not painful to pressure. It is important, however, that the patient be made to understand this, and a record of the fact noted on the case history. In cases where artificial substitutes are necessary, I would not hesitate to extract such teeth, if by so doing a more satisfactory restoration could be made. I have been interested to note the emphasis which Dr. Stewart places upon the probable relation of pyorrhea to systemic causes, and the importance of considering this in every case

which presents itself for treatment. I believe he is right, though that relation is far less obvious in some cases than in others, and may be altogether absent in some. The more, however, I study pyorrhea and observe it in daily practice, the more convinced am I that many cases are associated with factors other than those seen in the mouth, and I say this knowing from experience that many cases can be cured by local treatment only. My belief is, that whatever may be the predisposing factors in pyorrhea, they are not sufficiently potent in most cases to cause the loss of the teeth, in the face of careful local attention, and especially is this true where the disease has not progressed far. I believe, however, that an effort should always be made in suspected cases to get at the underlying systemic conditions. To this end it has been my custom for several years to inquire into these conditions with a view to obtaining some light on this side of our problem. Dr. William R. Williams and Dr. George Draper, among others, have co-operated with me in this work, and though much that is of interest has been learned, a sufficient number of cases have not yet been studied to justify any assertions at this time. In these cases a general physical examination is made, a urinary analysis, a leucocyte count, a differential count, the blood pressure, and, in some instances, a Wassermann test, and radiographs. Enough has been learned from these studies to indicate the probable relation which may exist between pyorrhea alveolaris and gastric disorders, articular arthritis, arterio-sclerosis, and as a complicating and handicapping factor in practically all chronic disorders. Just what the systemic factors are which predispose to pyorrhea are not as clear, but that there are such factors seems probable and justifies Dr. Stewart in his assertion that the presence of pyorrhea in the mouth will come to have a large diagnostic value to the physician of the future.

I am fully convinced that we have not yet touched the hem of the garment of Knowledge in so far as it relates to pyorrhea alveolaris, and the role which it plays in health and disease.

The "cutting off of the teeth to confine their vitality to

what remains " is a novel theory, and one which I doubt could be justified as routine practice.

Until our knowledge of this disease is wider than it is at present, I am inclined to advocate the practice of conservation, remembering that where there is life there is hope, and that there is no promise of resurrection for extracted teeth. There is one rule, however, which I believe applies to all cases—teeth which cannot be made sanitary and free from discharge as a result of treatment, should be extracted, for the end of every dental operation should be a clean mouth.

Dr. Charles F. Ash—I am not going to have very much to say on this subject, because I feel it is such a big one, and I know so little about it. If I say only a very little I will not be committing myself quite so badly as if I said more.

The essayist spoke of fitting bands under the gum, his method being to use a piece of pure gold and reinforcing it with solder. There are a lot of things that may be said for and against that method, but I believe that in proportion as the teeth have, or have had pyorrheal conditions, in just that proportion, so far as possible, should the margins of the artificial crowns be kept above the margin of the gum.

I do not believe that even with the skill possessed by the essayist, human hands can so prepare a band that there will not be a very distinct shoulder which can be felt by an instrument, and if it can be felt by an instrument, then it surely can be felt by the soft tissues; and while there might not be observable any redness to indicate an irritation, there must, to my way of thinking be some irritation, which obtains in many cases where we see absorption without any apparent redness or any visible inflammation—presumably a necrotic or some unusual condition set up there which makes not for the best good of the surroundings.

That is so true that you will recall on some occasions having had some of your friends come to you, and say: "There is a crown that I extracted last week, made seven or eight years ago in my office, and I thought I would like to keep it and show you what a nice fitting band that was." Now, those specimens are saved by lots of men and shown, because they

happen to have a good fitting band, as they call it; but as a matter of fact it is not the sort of a fitting band they would make if they had those roots and bands out of the mouth and could make them there.

I believe the bands should be made in such a way that there will be no break in their continuity with the surface of the root, and should not be carried above the gum margin.

The essayist referred to loose teeth, and as to whether they should be included in a bridge. Gentlemen, if the teeth are so loose as to become a question as to whether they should be saved or not, why should they be included in a continuous bridge?

It would seem at first glance that these teeth might well be extracted, and yet the question arises in my mind, Is it true that we are always doing the best for our patient by extracting a tooth which is somewhat loose, and would not stand alone? I have seen some cases, and have one especially in mind, where there was a loose left lower central. The case came under my direct observation while I was at college, but she was not a college patient. The patient went to the Middle West, and while there had that loose central banded to the central and lateral on either side—simple bands, and they were beautifully fitted, the bands being well away from the gum. These bands were cemented in place; but that patient came under my direct observation soon after she returned East, perhaps three or four months after the teeth were banded, and I observed at that time that the root of that left central appeared to be necrotic. It had a very dark color, and I made up my mind it was necrotic, and would not last long. The question arose, What would become of it when it became so loose it would not stay in place? I had it under observation for fifteen or sixteen years. I found after three or four years that that root had absolutely no attachment, so I cut off the root of that tooth and extracted the root, leaving the crown in place. That may seem like a very crude operation, and no doubt it was; but that tooth remained there suspended between the other central and lateral for thirteen years, in spite of the fact that there was considerable absorption originally

around the central and lateral. I claim that patient had good service, because lots of bridge work does not last thirteen years, although it is put in as a so-called permanent piece of work. At just what point we can say the patient is receiving or is not receiving good service is a grave question.

I have not had enough experience with these cases, and have not seen enough of them in my twenty years of observation to say whether it is always good practice to remove the teeth because they look dubious, or whether it is wise to try to save them.

The essayist spoke also of keeping the saddles clear from the abutments. He told me privately before we came in here, that his practice was to keep the saddle from touching the gum for the space of at least one tooth adjacent to each abutment. That is to say, back of each abutment there would be a space of one tooth where the saddle did not touch the gum. I take issue with him on that point; I do not see any reason for it, not even the reason he advanced. I claim that if the saddle is kept away from the abutment about the distance that would be required by the natural festoon of the gum, in case the adjoining tooth was there, you have carried it far enough away to maintain a condition of health, and that is not by any means the distance of a whole tooth.

He speaks also of the rigidity of bridges. He mentioned as an illustration a bridge carrying a second bicuspid and a first and second molar on one side, with a first molar on the opposite side. He spoke of the advantage of the solid bar which ran across the palatal surface to hold these in place, and showed you how the pressure coming on one side was relieved by the firmness of the teeth on the other, etc.

I take issue with him on that, or else he must revise what he said in regard to the advisability of each tooth in the mouth being independent and having its own mobility. He can revise either statement he likes, and when he has revised one of them I may take issue with him on the one that is left.

Dr. Stewart—State that again, if you please.

Dr. Ash—You said each tooth should move independently.

Dr. Stewart—I think you must have misunderstood — I

meant with the bridge off during brushing of the teeth, not with the bridge on during mastication.

Dr. Ash—You think during mastication it is better to have them all rigid? I take issue with that also. I believe if it is essential at all for a tooth to have individual mobility, it is when that tooth is being used in the process of mastication.

Dr. Paul R. Stillman—The gentlemen who are doing prosthetic dentistry seem to have covered that phase of the discussion of this paper very well. The part I am particularly interested in is the pyorrhea phase. There is one point that Dr. Stewart brings out to-night that I did not know he knew—I thought I was the only one who knew it. I told Dr. Hutchinson to-night that I thought I had some thing new. I find it is not new at all. For Dr. Stewart reports in his paper that he has used the method for fifteen years.

I have been practising extreme grinding of the natural crowns of teeth affected with pyorrhea for the purpose of restoring them to health. This grinding is not done simply to relieve the stress of mal-occlusion, but as an extreme expedient to enable the roots to become firmly fixed in the alveolar process, so that these teeth may rest for a time and then be utilized as abutments for removable bridges.

When the natural crown is ground to the extent I am about to describe, and the usual scaling of the roots thoroughly accomplished, there follows a remarkably rapid convalescence that may be obtained in no other way that I know of.

We will take, for example, a molar tooth, very loose, suffering from pyorrhea, largely because of traumatic mal-occlusion—a pocket extending nearly or perhaps to the apex, pus flowing—you all know the kind. After scaling a tooth of that kind, it very frequently disappoints one by not getting well. A great aid in making the cure will be found in grinding the crown, after the manner described by Dr. Chayes in his root preparation for the platinum jacket cast gold crown. The pulp should first be removed, the roots filled, and the tooth ground down to a short stump with its greatest diameter at the cervical border of the gum. It is very remarkable how rapidly such cases will become firm and healthy. These teeth should have at least three months' rest for convalescence.

I have enjoyed this paper very much. I have nothing to disagree with Dr. Stewart on the pyorrhea phase of the essay. I leave the prosthesis entirely to those men who are interested in removable bridge work.

Dr. H. E. S. Chayes—I assume that all of us here who have given the essayist our close attention are interested in one thing only, and that thing is the truth. We are searching eagerly for every bit of knowledge which will help us chart the road that shall finally lead us to our goal.

And so, the essayist, realizing as we all do, that only a free and unhampered discussion can bring out the weak and strong points of the paper, will accept whatever criticism I may have to make of his methods as being made in the interest of true knowledge, as I feel it and as I would convey it to you, and in no spirit of personal antagonism.

I take exception to the name of "Rigg's disease." It conveys nothing to the mind, and the consideration of it is a mental effort wasted.

I prefer to divide the condition now known as pyorrhea alveolaris into two stages.

First. The stage when we may find a distinct inflammation of the gum tissue around the necks of the teeth, more marked at the interdental spaces with no active suppuration, and I should like to call this an interstitial gingivitis; and, second,

We find the cases where neglect, at the first stage, has brought on a condition of active suppuration, and I should like to call this condition a case of suppurative gingivo-alveolitis.

Both of these names, immediately upon being heard, bring a picture to the mind of what we may expect to find, and really do find, in these cases; and that is what a name is for; to identify and make recognizable the thing named.

The doctor speaks of the advantage of cutting off the abutments flush with gum tissue, in an attempt to conserve their vitality and vigor and unquestionably that is correct under certain conditions, but should not be accepted as a universal rule and followed as such.

The essayist makes the statement that even if a case seems cured, or even if a piece of work remains in the mouth for five or more years, it is no evidence of a permanent cure, and that is quite true; but analysis shows that to be a fact in nearly, or very nearly, every disease to which human flesh is heir, and he might just as well have said, "That no matter how young we are, we simply must grow older, unless we die forthwith."

If we understood the physiological laws better than we do, if we knew all there is to know of internal secretion, if we understood the laws of growth, and tendency, and cosmic progression, and then, if understanding these laws, we worked with them toward the attainment of a fuller expression of life, we would be in a position to definitely state what is, and what is not, an absolute cure, but, lo! and behold! when we attain to that knowledge we will have no use for that kind of bridge work.

Has the essayist given us anything in his paper which will add to the sum total of true knowledge of the laws governing the harmonious actions and interplays of all functioning portions of our body? No; he has not, and the description of the mechanical fixtures he employs reveals also a misconception of the principles (mechanical and physical) involved.

It is time that we have a well founded reason for everything we do in attempting to regenerate the human body, whether it be the masticatory apparatus or the viscera.

And we cannot have well founded reasons for our acts, unless we have a true knowledge of the condition we attempt to deal with in an obliterative manner. If we resort to mechanical aid for the mechanical portion of the human masticating machine, we must have knowledge of two things: First, we must know how that machine works, when it is in perfect condition; and, second, we must know what mechanical principles have been violated in its degenerative course to a condition of disarrangement.

Not that I would have you understand that a pure mechanical knowledge and consideration of the case is sufficient for a desired result in such cases. We must remember that the per-

fect mechanical or physical in the human is but a material expression of the normal physiological and psychological, etc., that the former follows as a matter of course, when the latter is present, and that an absence of the former, in turn, has its retroactive effect upon the latter. There is an interdependence of these things, a very close interdependence of these things, and to ignore this interdependence is the most disastrous error we as ministers to part of human economy can make.

Just what then is the correct procedure to be followed in the mechanical part of the restoration of these cases? Clearly it must be that one which will most gratefully interplay with the physiological functioning of the oral and adjacent tissues, and thus make our effort terminate in a fuller expression of all powers centered in the region in which we are working. The procedure must be such, that this fuller expression of all powers centered in the region will be possible, with the least expenditure of physical effort; in other words, the expression of power or force, which we shall make, or attempt to make more efficient, more harmonious, more potent by means of our mechanical triturator, must become a grateful exercise play, and not a laborious effort.

Now, the methods the essayist describes lead to precisely opposite results; or, if not to that, at least they fall far short of being so planned, as to embrace a true philosophy of prehension, mastication and trituration.

We must remember that certain teeth in the human mouth were intended to be subjected to stress in certain directions only, and that if in the course of any supplemental mechanical substitution for lost dental organs, the remaining ones are subjected to any stress to which they are not originally intended, it becomes a question of time only when the pathological manifestations resulting from this misapplied stress will put in appearance.

A bar reaching across the mouth, to unite two pieces of artificial work, supported upon natural roots will in no way conserve the life of these roots, unless some means is provided which will allow some play of the artificial fixtures, independently of the roots which serve as supports.

No such provisions are made, in any of the fixtures, advocated by the essayist, and for this reason, if for none other, these fixtures must be taken exception to.

A saddle should be joined to the adjacent abutment, just as close as the festoon of the gum will permit, as Dr. Ash has told you, and it should be joined to the abutment, under the conditions of extreme masticatory stress. So that when the finished piece is placed into the mouth, the gum tissue will by means of its inherent resiliency raise the piece to a small extent, and thus throw the force or strain partially off and away from the abutment. When masticatory stress is put upon the piece, it will be found to ride, so to speak, upon the gum tissue covered with this saddle. This will furnish, first, a resilient cushion for the fixture; and, second, the amount of exercise necessary to keep the gum tissue in a healthy condition.

When this practice is adhered to, very little absorption, if any, will take place under the saddle, and no saddle changes, spoken of in the essayist's paper, will be called for.

With the essayist, I believe in having any piece of bridge work of more than one tooth, removable, but that in itself is not sufficient.

The piece, in order to be truly serviceable, must be so constructed that it will play freely under the stress of mastication, without compelling the abutments to play with it, and the importance of this is in direct proportion to the extent and complexity of the piece.

I call a piece of bridge work, which is made to supply anterior teeth alone and which uses anterior roots for abutments, or support "a simple piece of bridge work," and one which supplies both anterior and posterior teeth, and uses either anterior or posterior roots for abutments, "a complex piece of work."

A piece of complex bridge work, using anterior and posterior abutments, is doubly complex, because the area of surface and variety of abutments involved makes it necessary to take care of a variety of stresses. And it must be borne in mind always, that the area offering the stress resistance must

be far greater than the area exposed to stress, or the piece will ultimately fail.

There are some here to-night who believe that fixed bridge work answers every purpose, and they are convinced that they are justified in their belief. It would take a long time and a long period of careful instruction to make those men see the light. I cannot go deeply into this phase of this question at present without unduly trespassing upon some one's else time, and I do not wish to do that, but one thing I would ask these men, and that is, "Have they ever realized that two or three or four or five abutments, carrying a full upper or full lower denture, in the shape of a fixed bridge, produces an ankylosed condition in that upper or lower denture, as the case may be. The shock of biting upon any one part of that bridge is transmitted to every other part of it, and there is absolutely no individual tooth motion.

The stress exercised against such a piece of work is never dissipated, but always cumulatively detrimental in its consequences, upon the abutments, and upon the nervous system of the patient.

I would ask these men to remember that nature never intended a central incisor to be taken on a trip when a molar in the same mouth is moving, and neither is a second molar supposed to accompany a lateral during its excursions; and I would ask the essayist to remember, that in order to truly serve its purpose, it is not sufficient for a piece of bridge work to be removable from the mouth, but it must, to a limited extent, be movable, while in position in the mouth, and it must be movable in every direction, in which the natural teeth, the place of which it has taken, were movable while they were in position; and the mobility of this fixture, while in position, must in no way whatever induce any undue or foreign stress upon the abutments used for its support.

Dr. N. T. Shields—The main stress of this paper has been thrown upon the subject of removable and fixed bridge work.

In the matter of a permanent bridge, in comparison with a removable bridge, I would state that if the essayist, when he found a great deal of suppuration around the inferior bridge,

and which caused him to make an earnest endeavor in the direction of a removable bridge—had he then bent his energies in the direction of a permanent bridge, constructed on scientific lines, the patient would have had absolute comfort. The construction of a full removable bridge with a bar extending across the posterior portion of the hard palate is altogether out of order. I have removed a great many, and I expect to remove a great many more. A man fifty or sixty years of age, having one of these removable bridges, is subject to the same inconvenience that a younger person would be in wearing a temporary regulating appliance constructed with a bar in a similar position. To me this is sad beyond words.

I have been preparing the teeth and constructing the foundations as described by the essayist since 1886, and published in the *Dental Cosmos* in July and August, 1893. In my hands I never have occasion for removable bridge work. I take the first step in a permanent manner by extirpating the pulps mechanically, and, after thoroughly cleansing, thorough asepsis being maintained throughout, the canals should be filled at their apices with gold and the remaining portion with oxychloride of zinc. Then a permanent piece of work should be constructed. There is no question about involving the cuspids where you have the two centrals in a state of great looseness, and, furthermore, if you find the bicuspid in bad condition include them, and if the molars are in bad condition include them—then we have an entire permanent bridge or splint.

In regard to the construction of the bridges and the contouring of the teeth and bands, all of which is proper, the essential thing is not to know how far to contour, but to construct the bridge and splint, so that your patients will be able to pass toothpicks between the teeth, with the bridge work in position, and keep their mouths cleaner than they could possibly with the long exposed roots without the bridge. With thorough prophylaxis the saliva will do the rest; you will then have absolute comfort with your permanent splint, provided the mechanism of each tooth is perfect in its construction.

Dr. Chayes—Dr. Shields speaks of the fixation of an entire upper or lower splint by means of a bridge. I want to ask Dr. Shields what is the difference between a fixed bridge for the entire upper jaw and an ankylosed condition of implanted teeth, and I want to ask him how in a fixed bridge on a lower jaw or an upper jaw he obviates compelling the anterior teeth to do the same service the posterior teeth do.

How do you obviate subjecting the anterior lower teeth to a lateral or rotary stress when they were intended by Nature to carry only a vertical stress?

Dr. Shields—You do not make them according to any stereotyped method. You know the general contour of your patient's jaws. If a person has a jaw with receding chin, the anatomical restoration should be such that the patient knows no difference between that class of restoration and the natural teeth.

Dr. Chayes—That does not answer my question. I grant you that should be the case. How do you obviate causing the anterior teeth to be subject to a lateral rotary stress when you band them together in one solid mass?

Dr. Shields—You are simply borrowing trouble.

Dr. Chayes—You are; I grant you that.

Dr. T. P. Hyatt—It seems to me that the majority of the speakers have failed to grasp the main point of Dr. Stewart's paper—that he is advocating a simple mechanical principle that can be applied in pyorrhea cases.

One of the speakers this evening said you cannot lay down a rule that every man may follow. He did not state a truth. You can. If you can discover a simple principle, and it is really a principle, it can be applied to any and every case. I think the principle Dr. Stewart brought out to-night, that nobody has spoke of, was that each one of the teeth that is to be used in any form of a splint should have the stress brought straight down. The lateral stress or strain, or any anterior or posterior motion, is to be taken care of by other means. This is done by bars and saddles. I am sure there is not any case ever presented to any man which may not respond to an intelligent application of that principle. I think

that this is the main point that Dr. Stewart wanted to bring out. He then shows how he attains his results by following this principle.

To attend a meeting of intelligent men, and find so many speakers absolutely failing to grasp this point, is to me astonishing. At the same time it is disappointing to find that the majority of those that discuss a paper containing new ideas seem to think they must destroy it. Instead of welcoming and helping the man who is willing and brave enough to present a new method of making artificial appliances that he believes to be particularly beneficial in pyorrhea cases, and that may help his fellow members, there are those that at once scent a hunt, a chase, and perhaps a killing.

In regard to the putting of solder around the band of the root, I do not think Dr. Stewart had in mind an ordinary crown; it was simply a cap for the root. The sides should be contoured as near as possible to an approximate shape of what would be the condition of the root if you cut the crown off. You restore as near as possible the enamel above the root with your band and gold solder. These castings of Dr. Stewart's, which I have had the good fortune to see, bear out everything Dr. Stewart has said.

I want to emphasize the point that any man can apply a principle. A principle is a truth that can be applied.

Dr. M. L. Rhein—I sympathize with the essayist this evening. When he started his paper he said something about the necessity of producing this paper in annual installments, evidently realizing the impossibility of the task which he had set out for himself. In attempting to cover too large a field, he has to a certain extent placed himself in the dilemma that has left him open to some of the attacks which he has received. I have very few differences with the generalities of the essayist. In his remarks on the nomenclature of the subject, he spoke of a great many names for periodontal diseases, but he happened to overlook the nomenclature which I first introduced in 1894. My confidence in it was strengthened when the late Professor Miller adopted my nomenclature wholesale in his work on operative dentistry. I was sorry Dr. Stewart overlooked the

fact, especially as the very logical deduction he made in regard to the etiology of this disease would naturally lead him up to this nomenclature which simply consists in the addition of the proper etiologic adjective as pyorrhea diabetic, pyorrhea tubercular, etc.

It has been brought out this evening more than once that it is the particular cause of cases of this kind that must be considered. More than once the essayist left that impression so vividly that we could not get away from the fact that this is the gist, the crux, of the whole matter.

The case of pyorrhea arthritis is so absolutely contradictory in its pathological symptoms from one of pyorrhea diabetic, that the same principles will not hold for both. In adopting the theory brought out by the essayist of the etiology of these conditions, you must run the whole gamut of mal-nutritional disorders, and consequently it does not take very much thinking to realize that the principles that will apply to a tuberculous case would not apply necessarily in a case of Bright's disease or diabetes, and the same reasoning applies to all the numerous forms of disease that are productive of mal-nutrition.

When we consider this thing from a scientific standpoint, we must get back to the principle so frequently mentioned by Dr. Talbot, that we are considering an end organ, and an end organ of the body is the first one to bear the brunt of mal-nutrition. Now, it is in this respect that I take exception to the essayist's diatribe against the value of a fixed splint at the present time.

I thoroughly agree with him that the fixation of diseased teeth has been terribly abused; that, for instance, in arthritic pyorrhea, it is generally uncalled for and seldom serves a useful purpose, because in this condition the diseased teeth are sooner or later disrupted from what is left of an alveolar socket.

In a diabetic case, on the contrary, we get absolutely the best results from fixation. Fixation only at the time of mastication in these particular cases is not sufficient. It is impossible to discuss this subject in the manner it should be, in the

time we have, and I am going to leave this phase of it at this point, to take up another point where I totally disagree with the essayist. One of the few things that I disagree with him on is what he had to say in reference to the subject of the saddle in a piece of removable bridge work.

Now, there is as much superiority in a removable piece of bridge work over the best piece of fixed bridge work that was ever made, as there is between the light of sunlight and the light that we get from the glimmering of the stars at night; but when I say removable bridge work I mean a piece of work that is constructed correctly, and that means something quite different from what is frequently assumed. I have had brought to me what were supposed to be pieces of removable bridge work. Well, they can be removed, and they are meant sometimes to be removed by the dentist to be cleaned, but in my opinion they should have been removed before they were inserted.

In discussing this subject with a patient who needs the restoration of teeth of that kind, it is a very common thing for me to make the comparison between the kind of work that is embraced by my idea of removable bridge work and other kinds of work, by comparing a beautiful hand-made chronometer and a dollar watch; and that illustrates perhaps as well as anything what I mean, when I refer to the necessity of the most absolute accuracy in every part of the work.

Dr. Chayes, in discussing this phase of the subject, said for those gentlemen who were not competent to make a proper band, it would be well for them to have the root extend above the free margin of the gum; but I believe that Dr. Chayes meant that it would be better for the patient if those men did not attempt to do anything for any patient in that particular line of work, and that sums up the essence of this whole subject.

Dental work, as I have frequently said, is a luxury, and unless it can be carried out to its extreme point of perfection, it becomes a gold brick to the individual we try to sell it to.

I understand the essayist is opposed to throwing the stress of mastication on the saddle. I thoroughly agree

with his principle of having the stress vertical on the abutments, but just as we attempt to restore the physiologic action of the roots of these abutments to get the full benefit of usefulness for a denture of this kind, we should restore the physiological usefulness of the mandible or the maxilla. Drs. Chayes and Ash very well said we should not get the saddle in close juxtaposition with the abutment, but should construct it so as to give the teeth that are located on the saddle, the duty of restoring the natural function of that part of the jaw over which it is placed.

The question of the possible atrophy of the gum under bad conditions is another point, and there the essayist has very wisely spoken of the necessity for so constructing this work as to allow of the changing of the saddle in case of any possible atrophy occurring, either of the mandible or the maxilla; but I believe also in this respect that a great deal of this atrophy that has taken place has been observed mostly in cases where there has been some faulty construction.

I apologize, Mr. President, for the length of time I have spoken, and reluctantly take my seat, complimenting the essayist, and feeling assured that if he will look up this form of etiologic nomenclature he will, perhaps, abandon the obsolete term of "Rigg's disease."

Dr. Stewart—Now, I had better begin by begging Dr. Rhein's pardon. It was not that I did not think of his nomenclature in writing my paper, but because I did not have time to discuss everything. Dr. Rhein gave us our first intelligible classification, and his classification has led the profession more than any one thing, possibly, to regard the disease from a systemic standpoint instead of looking at it as a purely local trouble. Dr. Rhein evidently misunderstood me about saddles. If I did not want mastication above the saddles I would not put teeth there. I want perfect occlusion, and every tooth in each jaw to do its work. The point I made about the saddle was that it should not press the gum close to the abutments.

Dr. Arthur Merritt has a classification which is not as yet committed to print, but is well worthy of thoughtful study. Of course, the president made what suggestions he could to

me; and I gathered that he meant for me to write my paper so as to elicit a discussion, and I compliment him on the result.

I utterly fail to see in what manner Dr. Ash reasons. He states first, that the teeth should have individual motion in mastication under bridges. Now, is it not a fact that if you fasten teeth rigidly together with any kind of a bridge it is impossible to get individual motion? (Chorus of "No.")

How any man with any mechanical ideas can argue that teeth (two or three or any *other* number) held rigidly together with a bridge do not have to move bodily together in all directions during mastication is past my comprehension.

We are now discussing teeth with alveolar bone largely absorbed; teeth that could not stand up under individual motion in mastication; teeth that need bracing, and it is for this reason that these bars are used to make useful and permanent the teeth that will inevitably be lost if this leverage is not thus overcome.

Now, as to bands and getting the exact reproduction of the original tooth: of course, it is not necessary to get just exactly in bulk the same amount of solder as the tooth had of enamel. The object is to get about the amount the average tooth would have. This criticism really needs no answer.

Adjournment.

FREDERICK C. KEMPLE,
Editor, First District Dental Society.

BOSTON AND TUFTS DENTAL ALUMNI ASSOCIATION

October 8, 1913.

The first meeting for the season 1913-1914 of the Boston and Tufts Dental Alumni Association was held at the Hotel Lenox, Boston, on the evening of Wednesday, October 8, 1913. The largest number that has ever attended a regular meeting responded to the notice sent out by the executive board.

The business meeting, held just prior to the dinner, was called to order by the president, Dr. A. G. Richburg, and various matters of a routine nature were taken up. Several important committee reports were read and new members appointed for same.

The motion of Dr. N. I. Brigham that a clinic room with equipment, for the use of visiting members of the profession be fitted up at the college buildings, was favorably received, and such a committee was appointed to work in conjunction with the Dean.

The question of raising an endowment fund for the use of the Dental School was introduced by the president; the idea, as set forth by him being to place the school upon a firm financial basis. A committee, consisting of three members, was appointed to take this in charge; Dr. Walter H. Arnold, ex-president of the association, to be chairman; Dr. P. H. Barton and Dr. J. W. Ball being the other two members for this important and very necessary work.

The meeting then adjourned to the dining room, where a splendid dinner was served. After this pleasing duty had been attended to, the speaker of the evening, Dr. William H. Potter, Professor of Operative Dentistry, Harvard University Dental School, was introduced. Dr. Potter, in an easy informal manner, entertained and instructed his audience for some time, and the end came all too soon. The subject, "General and Local Anesthesia in Dental Practice," was handled in a masterly way, and proved of great interest to all. The apparatus used by the speaker in his own practice was shown and demonstrated, and proved to be that of Dr. Guido Fisher, of Berlin.

Some references were made to Dr. Otteson, of Norway, although the method of the latter was modified as shown and explained by the speaker.

Other methods pertaining to this subject were discussed. All voted hearty thanks to Dr. Potter for his instructive address.

By vote of the association the next regular meeting, which is scheduled for December, will be discontinued, in favor of the union meeting of the Allied Dental societies of the State of Massachusetts.

A committee from the B. and T. D. A. A. will work in connection with those appointed by the various societies, and this programme will be announced later.

One new member was elected to membership. Adjournment.

ALFRED G. RICHBURG, D.M.D.,
Editor, Boston and Tufts Dental Alumni Association.

THE JOURNAL OF THE ALLIED DENTAL SOCIETIES

WILLIAM B. DUNNING, D.D.S., *Editor*

S. ELLSWORTH DAVENPORT, JR., D.M.D., *Associate Editor*

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No. 4

EDITORIAL DEPARTMENT

A CODE OF HONOR

It is reported that subscription to the following code of professional conduct is required of those invested with fellowship of the newly created American College of Surgeons:

"I pledge myself to pursue the practice of surgery with self-restraint and to place the welfare of my patients above all else; to advance constantly in knowledge by the study of surgical literature, the instruction of eminent teachers, interchange of opinion among associates, and attendance at important societies and clinics; to regard scrupulously the interests of my professional brothers and seek counsel

when in doubt of my own judgment; to render willing help to my colleagues and to give freely my services to the needy.

“Moreover, I pledge myself so far as I am able to avoid the sins of selfishness; to shun unwarranted publicity, dishonest money-seeking and commercialism, as disgraceful to our profession; to refuse utterly all secret money trades with consultants and practitioners; to teach the patient his financial duty to the physician, and to urge the practitioner to obtain his reward from the patient openly; to make my fees commensurate with the service rendered and with the patient’s rights, and to avoid discrediting my associates by taking unwarranted compensation.”

There is something about a pledge at which one is inclined to shy: its very making conjures up the first thoughts toward breaking it. The drunkard signs his “pledge” because he knows he is too weak to practise the restraint implied therein without this public avowal of good intentions—without the help of his neighbors in witnessing his well doing. He thus throws the burden of his reformation upon others, knowing there is not that within himself sufficient to meet the ordeal before him. But human nature is so constituted that things formally forbidden acquire, automatically, a secret attractiveness; and before the ink is dry he feels his thirst arising.

The formal pledge, however, has value if only to deter weak individuals from transgression through the fear of open scandal. But far beyond this lowest of uses stands the true mark at which men have aimed since the beginning of the world in their imperfect aspirations to better things. The very act of formulating a rule of right conduct schools the mind to the

terms of the problem. The ethics of modern society are too intricate to make possible the exercise of right conduct by instinctive impulse alone; a man may not say how he shall treat his neighbor without pondering thereon. It is a fact that if the instinct of gentleness does not exist, the formula is barren indeed. But this is an inverted way of saying that the man of professional responsibilities, in addition to being a gentleman at heart, must be a gentleman by the cultivation of exalted ideals. The most direct way of doing this is by attempting to formulate right conduct; and, provided the mark may be reached, it is well to place it high.

The formula quoted above is written expressly for the specialist in surgery. It is, however, admirable in scope, and applicable to the practitioner of any department of medical science, in serving to crystallize in the mind already trained to unselfish endeavor certain items or factors which make essential parts of the grand total.

The best of us weary in well-doing at times—the heat of the day beats upon all men, and all men are finite in patience and pluck and nerve. It is wholesome to be reminded of the terms upon which a man may live at peace with himself, honored by his colleagues, and blessed by the innumerable beings who have known his skill, gentleness and unfailing cheer.

THE RELIEF FUND OF THE NATIONAL DENTAL ASSOCIATION

The proposal of the Relief Fund Committee of the National Dental Association, printed on another page,¹ is worthy of the generous response of our profession throughout the land. Christmas-tide is approaching—a fact which perennially opens the heart toward those in need. The poor are ever with us, and as the decline of life approaches to each individual, the possibility of want becomes less distant—even to the most prosperous. Some of us have led or are leading lives of frugal care with a view to the inevitable evening when man may not work. But very many of our number, in common with most men of professional training, spend freely in their harvest days, and have little to show for their toil later on. It is not impossible that any dentist reading the appeal of the committee for help may at some time to come feel directly the wisdom and humanity of the founders of this Relief Fund.

This is not suggested, however, as a motive for contributing to the fund in question. No man should imagine he may go through life with ordinary self-respect and without the deliberate outlay of occasional sums of money given to pure charity—though the man who is benevolent in his prosperity may with the better grace receive alms in his need. At the moment of giving there should be no ulterior suggestion of any

¹ See p. 414.

kind—and such is not likely to occur, since most men hope to escape the need of charity.

What worthier benevolence may we advance than that which strives to relieve impersonally the pinch of poverty when it comes to individuals who have grown old in the service of mankind? What branch of the healing art calls for a more unintermitted drain upon one's vitality than the practice of dentistry? What more efficient way may one find of applying one's modest contribution toward the help of destitute brother practitioners than through the organized work of a special committee of the greatest existing dental society?

Now "is the time to subscribe." THE JOURNAL respectfully suggests that every man who is minded to share in the creation of this permanent relief fund go about it at this Christmas season, while the heart is warm—and in a businesslike way. Let him send one dollar, or five, or fifty, to the committee, with a note to the effect that for so long as he is financially able he will repeat the gift each Christmas-time. If many of the fifty thousand of our profession in this country should do this, the labors of the committee would be light in so far as the fund itself is concerned.

NOTES ON PRACTICE

COMPILED BY WILLIAM D. TRACY, D.D.S., NEW YORK CITY

Condensation of Amalgam.—The extract from an article by Dr. J. F. Wallace, *Western Dental Journal*, under the above heading in this department last September was interesting and true.

It seems to me, however, that no statement concerning the condensation of amalgam would be complete without reference to the use of Japanese bibulous paper as a buffer between the amalgam and the packing instrument as first suggested by the late W. G. A. Bonwill. This method of packing secures two essential results: the amalgam is pressed against the walls of the cavity and into all inequalities, the material being prevented from oozing around the packing instrument, and all excess of mercury is brought to the surface from which it can easily be removed before more amalgam is added.

The skillful use of this method reduces the importance of the shape of the instrument used in packing.—S. E. DAVENPORT.

Making Gutta-percha Points More Rigid.—If difficulty is found in placing long, thin gutta-percha points in position because they are limber, they should be placed for a few minutes in ice-water. Thus chilled they become more rigid.—A. J. COTTRELL, *Dental Brief*.

Cleaning Glass.—If the fountain cuspidor or other office glassware becomes coated with a white deposit from hard water, a few drops of nitric acid will dissolve the coating and leave the glass sparkling and bright. The acid may be easily applied with a pellet of cotton held in tweezers.—*Western Dental Journal*.

Advantages of Platinum Collars in Crowns.—One of the many advantages of platinum collars is that the thin platinum which almost entirely forms the edge of the collar admits of the most accurate and close adaptation to the cervix of a root or crown. This is due to the fact that platinum, being a very tenacious metal, can be trimmed down to form an extremely

thin edge, which will not be destroyed by fusing in any subsequent part of the work.—G. EVANS, *Items of Interest*.

Lanolin for the Hands.—Lanolin is an excellent emollient for the hands. Its occasional use will keep the skin smooth and supple; for this purpose it is better than glycerin. Glycerin tends to draw the moisture from the skin, and at times it is irritating, while lanolin is soothing and healing. If scented with a delicate perfume and well rubbed into the skin after washing, it will keep the hands in good order. It is not at all expensive, and a little goes a long way. It is especially useful when the hands become chapped, and as a soothing application to the skin-cracks so annoying to some during frosty weather.—J. H. GRUMM, *Dental Brief*.

Warnings in Regard to Bridge Abutments.—Do not place bridges upon abutments that have not been first made, through prophylactic measures, as healthy as it is possible to make them.

Do not place gold-shell crowns upon vital teeth unless thoroughly conversant with methods for removing enough of the enamel to straighten the sides.

Do not use unnecessary facings upon bridges used for masticating purposes only.

Do not cement a bridge to place which draws or causes the teeth upon which they are placed to feel uncomfortable, because it is less trouble to saw it apart and place the parts in position and resolder than it is to lose a good patient and a couple of good teeth.—J. M. THOMPSON, *Dental Summary*.

To Prevent Porosity in Thick, Heavy Lower Vulcanite Dentures.—In making thick, heavy lower dentures, it is important, when flasking the case, to avoid using oil as a separating medium, as it has a detrimental effect upon the rubber during the vulcanizing process. Either a syrupy solution of soap or one of the many separating fluids which are sold for the purpose should be used—oil never.

Further, when packing the rubber in thick, heavy lower dentures, the center should be loaded with small pieces of old vulcanized rubber; then the temperature of the vulcanizer is raised very slowly to 315 degrees F., and the case vulcanized

for fully seventy-five minutes at this temperature, when a hard, dense vulcanite plate, entirely free from porosity, will be the result.—*Ash's Monthly*.

Bridge Attachment with the Aid of Accurately Cast Gold Inlays and Gold Mesh.—An accurately cast inlay to be used for an abutment for a bridge can best be obtained by reinforcing the wax pattern with gold mesh. Gold mesh, used as a framework and not as a matrix, controls both the shrinkage and warpage in the wax patterns in a vast majority of cases, and is a very distinct aid in making cast bases for crowns and in compound inlays for the bicuspid or molar. In bridge work it greatly facilitates the arrangement of the dummies, enabling the operator to carry the wax just where it is wanted, and lending strength to shallow wax patterns. In the casting of removable bases, it has been found a very great aid. In making bicuspid and molar crowns with cast cusps it is a splendid substance for placing the wax pattern upon, and in the mold it apparently fuses perfectly with molten gold.—G. F. BURKE, *Dental Summary*.

Welded Gold Bands in Crown and Bridge Work.—In crown work, welded gold bands have many advantages over the usual soldered bands which are so generally used, in that, when properly sweated, bands are much stronger at the seam than at any other part, and no matter how many times they are put through the fire, they never come undone. Also, when the ledge formed by the overlapping band is filed away, the usual line which would be present if solder were used is absent, as the karat is not lowered by the addition of solder, and the color is the same throughout.

By this method a whole crown may be made without the use of solder, provided perfect contact be obtained with cusp and band, and the cusp be filled with the same karat gold as the band. Twenty-two karat gold will weld very nicely, but coin gold works very much more smoothly, and is better by far for this work, as the copper in the alloy helps its flowing qualities.

In welding a band, the two edges are not brought together as in soldering, but one edge overlaps the other a fraction of

an inch, the under edge being sharply beveled, and perfect contact being obtained with a pair of pliers. A little liquid flux is now allowed to run the length of the joint, the band is placed upon a charcoal block, and the flame applied. At first the whole band is heated to a red glow, then the blue flame is centered at the lower edge—or the edge nearest the worker—and when this begins to fuse the flame is moved rapidly up the seam. This may be done several times, depending upon how heavy the welding is desired, or if the contact is effected by the heat. A brush flame does almost as well as the blue flame; operators, in fact, prefer it. As the flame is moved up the seam, a dark line may be seen to follow the seam; this indicates fusion. This is also a guide when sweating a crown.

The portion of the band burned where fusion starts may be filed out and used for the mesial or distal festoon.—R. L. WHELESS, *Texas Dental Journal*.

Requirements of a Crown.—We must bear in mind (1) The artificial crown must not in any way encroach upon the soft tissues. (2) At no point of its gingival circumference shall the continuity between the artificial crown and the dental organ be broken. (3) The artificial crown must restore to the broken-down tooth all the means of exercising the functions which nature intended it for—viz., prehension, incision, mastication and trituration. (4) Whether it be a posterior or an anterior crown, its phonetic service to the vocal organs must not be diminished, interfered with nor made doubtful. (5) It must be perfect in its occlusal relations to the teeth opposing it, and (6) must be perfect in its occlusal relations to the teeth abutting it on either side. (7) It must be in perfect harmony with the soft tissues of the buccal cavity, the cheeks, the lips, and the tongue. (8) It must be so contoured that, if divided into three parts, occluso-gingivally (horizontally), its greatest circumference must be at the gingival plane of the occlusal third, and its smallest circumference at the gingival plane of the gingival third. (9) The preparation of a tooth for the reception of scientifically constructed artificial crown includes the denuding of all its walls so that they be left minus enamel. (10) The proper preparation of a tooth

for the reception of a crown implies the extirpation of the pulp—if vital—under cataphoresis, pressure anesthesia, or nitrous oxid; the proper treating and filling of the root-canals, and such dressing-down of its walls and occlusal surface as will permit the placing of a hood upon it, the vertical lines of the walls of which are at the right angles to the horizontal plane of the gingival third of the tooth, regardless of its relative occlusal position within the buccal cavity.—H. E. S. CHAYES, *Dental Forum*.

CURRENT DENTAL LITERATURE

COMPILED BY C. FRANKLIN MACDONALD, D.M.D.

WHY FORMALDEHYDE PREPARATIONS ARE CONTRA-INDICATED IN SEPTIC ROOT CANALS. With a Practical Scientific Method for the Treatment of Putrescent Pulp. By Dr. C. J. Grove.—*The Dental Review, Chicago, October, 1913.*

Dr. Carl J. Grove in this paper once more takes the stand against the use of formaldehyde preparations in the treatment of septic root canals, especially the use of the tricresol-formalin remedy.

The essayist bases his contentions upon the known irritating action of formaldehyde gas and the coagulating effect of this gas upon albumin. The claim is made that the irritation of the tissues at the root apex is the first effect, resulting in inflammation with the usual seminal exudate consisting largely of albuminous products. This, by the action of the formaldehyde gas, is coagulated, and along with proteid tissue, is converted into a hard leathery substance which acts as a foreign body. The tricresol in the combination is claimed to have no effect upon the action of the gas. A frequent cause for the occurrence of abscesses following root canal fillings is said to be the existence of this irritating substance at the apex.

As to the chemical theories involved, the essayist proceeds to show that the conclusions of Dr. Buckley relative to the formation of free sulphur and methyl alcohol are erroneous.

Another remedy is recommended, consisting of equal weights of thymol and chloral hydrate to which is added calcium hydroxid, to be used as a dressing. The author claims: for the chloral hydrate a great affinity for the various compounds of ammonia and sulphur, and for the calcium hydroxid the neutralization of carbon dioxid; these being, in his belief, the most important products of pulp decomposition. The thymol is added for its powerful antiseptic properties.

The sodium-potassium method of root canal cleansing is

advocated with the final root filling of euca-percha or chloro-percha and gutta-percha points.

THE DOUBLE BOW CLASP. By F. E. Roach.—*The Dental Review, Chicago, October, 1913.*

Realizing that clasps, as a form of mechanical fixation for partial dentures, are widely employed, the essayist states his ideas of clasps and clasping, condemning the broad band clasps, especially those clasps without lugs to prevent settling. He prefers the small round or half-round wire, claiming—greater range of adjustment, longer spring, greater strength for a like amount of material; that it is less liable to cause decay, and more easily kept in surface contact with tooth in cases where occlusal lug are not feasible.

The author presents for consideration an ingenious form of clasp which he designates as a "double bow," and with which he derives much of the spring and clasping upon the proximal surfaces of teeth rather than upon the buccal and lingual. It consists of a loop suspended on each end of a U-shaped bar, the U-shaped bar running between the teeth to be clasped with ends so bent as to form the occlusal lug.

Another method of taking impressions where one tooth is to be supplied by means of a removable plate is shown. This consists of taking a separate impression of the ridge, and with this in place, taking an impression of the occlusal surfaces of the adjoining teeth. By this method a compressed impression of the alveolar ridge is obtained which is important with this kind of appliance. Dr. Roach also advises making models of modelite, low fusing alloy, or cement.

FORMALDEHYDE. A CURE FOR PYORRHEA ALVEOLARIS. By G. A. Barnett.—*Western Journal, 1913.*

Dr. Barnett, in a short communication, says: "I have found that a solution of formaldehyde will positively cure pyorrhea in its worst form." He claims to get almost instant relief from pain and rapid stopping of pus flow, and tightening of teeth.

A case, he selects to describe, as typical of many. Patient of fifty-six, inferior anterior teeth barred together, gums inflamed and abundance of pus and purulent matter exuding.

After removal of calcareous deposits he prescribed ten drops of formaldehyde to half-glass of water and added formaldehyde until there was slight burning sensation about necks of teeth. Sees case every sixty days for prophylactic treatment, there now being no signs of pus, gums hard, and teeth tight.

For general treatment he begins with eight to ten drops in half-glass of water, increasing or decreasing as necessary, until the burning sensation is just noticed, which sensation is said to be imperative. He promises later to present what he has found to be the principle cause of pyorrhea.

CURRENT NEWS

Items of professional news, of general interest, will be welcomed by the Associate Editor at 51 West Forty-seventh Street, New York City.

The sections, carried on by the First District Dental Society of the State of New York, under the supervision of Dr. W. W. Walker, commenced their work for the season in November. Dr. Walker, who is chairman of sections, is largely responsible for the growth shown from year to year, and the sections now form really a post-graduate school, which is doing much in the advanced instruction of all members who are wise enough to take advantage of the great opportunities offered them.

The number and scope of the sections has increased from year to year, until, at the present time, nearly every important phase of dentistry has been included in the complete course. Prominent men in different parts of the country have agreed to lecture to these several bodies, in addition to the leading New York dentists who give so much valuable instruction to those interested.

Altogether, then, the present year promises to be more successful and instructive than any of its predecessors, and New York professional men should realize the exceptional chance presented to them in time to derive its benefits.

Following is a list of the various sections, each having a chairman, though all are under Dr. Walker's general guidance:

Eclectic Orthodontia, Dr. Frederick C. Kemple, chairman, 576 Fifth Avenue.

Crown and Bridge Work—Porcelain and Gold Inlays, Dr. Wm. D. Tracy, chairman, 46 West Fifty-first Street.

Oral Surgery and Pyorrhea, Dr. H. S. Dunning, chairman, 17 East Thirty-eighth Street.

Stomatology and Dental Research, Dr. J. Morgan Howe, chairman, 576 Fifth Avenue.

Dental Hygiene, Dr. C. C. Linton, chairman, 40 East Forty-first Street.

Prosthetic Dentistry, Dr. W. W. Walker, chairman, 58 West Fiftieth Street.

OFFICE OF

DR. EDWARD S. GAYLORD,

63 Trumbull Street, New Haven, Conn.

The Committee on the National Dental Association Relief Fund are, this year, instituting a more active campaign than has been followed since its appointment two years ago at the annual meeting in Cleveland, to solicit financial support to the extent of establishing a National Dental Relief Fund, the interest of which may be dispensed to members of the N. D. A. in good standing, who, by permanent disability, are unable to support themselves and those dependent upon them in the practice of their profession.

We are to issue immediately one million Christmas Seals of suitable design, to be used on all forms of correspondence or otherwise, and beg the assistance of the different Dental Depots or Supply Houses, to aid the Relief Fund Committee (without compensation) in facilitating the sale of these Seals, which is in every sense a work of charity.

Strict account of all disbursements and sales will be kept, and nothing but actual expense in printing and postage will be charged against the Fund.

All receipts from the sale of Seals, the price of which has been set at \$1 per hundred, should be forwarded to this office, when they will be turned over to Dr. H. B. McFadden, Treasurer of the National Dental Association, requiring his receipt for same. With the above described charitable object in view, are you willing to aid us? Posters of suitable design, announcing the sale, will be supplied with shipment of the Seals (to wit):

Christmas Seals
for the Benefit of the
National Dental Association Relief Fund,
For Sale Here.

If willing to co-operate with us, how many Seals may I send you?

Very respectfully,

L. G. NOEL,

WM. T. CHAMBERS,

JAMES McMANUS,

E. S. GAYLORD,

National Relief Fund Committee.

Dr. Alfred C. Fones, of Bridgeport, Conn., is a pioneer in the instruction of the Dental Nurse or Dental Hygienist, as he very properly terms her. Dr. Fones is not only a pioneer, but he has the courage of his convictions to such a strong degree that he has developed an educational course, for a limited number of young women, to be carried on in Bridgeport, beginning November 17, 1913.

This course will consist of lectures by over twenty of the most prominent men in the country, who are generously giving their time, and of six weeks' practical training under the supervision of Dr. Fones himself. It will be given at Dr. Fones's office, 10 Washington Avenue, Bridgeport.

The following is a quotation from the announcement of this course, showing its object:

"In the last few years there has been a great demand for women as hygienists and prophylactic operators in dental offices, for it is a well-known fact that at least eighty per cent. of dental diseases can be prevented by following a system of treatment and cleanliness.

"There is also now developing a demand for these women in public institutions, such as schools, hospitals, and sanitariums. . . . At the present time there is no standard educational course for these Dental Hygienists. The demand for these women throughout the country is sufficiently large to warrant a course of lectures, to be given by men who are authorities in their various specialties, these lectures to be printed in book form, and to be known as *A Standard Course for Dental Hygienists*.

"As there will be considerable expense attached to the management of these lectures, such as stenographer, stereopticon, chairs, manikins, etc., a nominal fee of twenty dollars will be charged to partly cover this expense."

In planning, developing, and carrying out this project, Dr. Fones is making a very great sacrifice of time, money, and energy, and he should be heartily commended, both by his professional confreres and by the public for his philanthropy. The book resulting from the lectures, entitled, as stated above, *A Standard Course for Dental Hygienists*, is bound to be of value to all practitioners. We congratulate Dr. Fones.

Following is the complete syllabus of the lecture course:

- (1) Anatomy. By Raymond C. Osburn, Ph.D., Professor in Barnard College, New York City.
- (2) Physiology and Visceral Anatomy. By Yandell Henderson, Ph.D., Professor of Physiology, Medical Department of Yale University.
- (3) Bacteriology and Sterilization. By L. F. Rettger, Ph.D., Assistant Professor of Bacteriology, Yale University.
- (4) Anatomy and Histology of the Teeth and Jaws, Nomenclature. By R. H. W. Strang, M.D., D.D.S., Bridgeport, Conn.
- (5) The Skin in Health and Disease. By Dr. George M. MacKee, Instructor in Dermatology, College of Physicians and Surgeons, New York City.
- (6) Oral Secretions. Deposits and Accretions of the Teeth. By Edward C. Kirk, Sc.D., D.D.S., Dean of Dental Department, University of Pennsylvania.
- (7) Dental Pathology:
 - (a) Dental Caries. By Eugene H. Smith, D.M.D., Dean of Dental Department, Harvard University.
 - (b) Alveolar Abscess and Odontalgia. By M. L. Rhein, M.D., D.D.S., New York City.
 - (c) Pyorrhea Alveolaris. By R. G. Hutchinson, Jr., D.D.S., New York City.
 - (d) Malocclusion. By R. Ottolengui, M.D.S., New York City.
- (8) The Teeth as a Masticating Machine. By Chas. Turner, M.D., D.D.S., Professor of Mechanical Dentistry and Metallurgy, University of Pennsylvania.
- (9) The Chemistry of Food and Nutrition. By Russell H. Chittenden, Ph.D., L.L.D., Sc. D., Director of Sheffield Scientific School, Yale University.
- (10) The Dental Hygienist As An Assistant in Oral Surgery. By M. I. Schamberg, M.D., D.D.S., New York City.
- (11) The Dental Hygienist As An Assistant in General Practice. By Herman E. S. Chayes, D.D.S., New York City.
- (12) Hygiene:
 - (a) Factors in Personal Hygiene. By C. Ward Cramp-

ton, M.D., Hygienist and Director of Physical Training, Public School System, New York City.

(b) Posture and Fresh Air. By Professor Irving Fisher, of Yale University.

(c) Lengthening the Life of the Resistive Forces of the Body. By Dr. William Guilbert Anderson, Professor and Director of Yale University Gymnasium.

(13) The Teaching of Mouth Hygiene to School Children. By Thaddeus B. Hyatt, D.D.S., New York City.

(14) The Philosophy of Handling Children. By Edward C. Kirk, Sc.D., D.D.S.

(15) Dental Prophylaxis. By Alfred C. Fones, D.D.S., Bridgeport, Conn.

* * *

“Now it is **Hereby Agreed** that the company undertakes to indemnify the insured out of the capital, stock, and funds of the company against all claims for which the insured shall become legally liable, as and for compensation for injury or illness caused during the period covered by the premium so paid as aforesaid, or any further period in respect of which the company shall accept a premium or premiums, to any of the patients of the insured by the negligence of or unskillful treatment by the insured or their assistants in connection with the carrying out of their duties as dentists, and for costs incurred in or with reference to resisting such claims, but only to the extent of five hundred pounds for compensation and costs in respect of any one injury, and not exceeding in the aggregate the sum of one thousand pounds in any one year of insurance.”

The above is an extract from the policy, as published in *The New Zealand Dental Journal*, taken out by the New Zealand Dental Association for the benefit of its members, every member being one of the “insured.”

Here in the United States there are doubtless many individuals who have secured policies protecting them against suits for *malpractice*, etc., but we have not heard of any in-

stance where such a policy has been broad enough to include a whole dental society.

We are not prepared to say, as yet, that a policy of this kind would be worth while, since any individual may take out one of his own if he wishes; but the idea, as far as we are concerned, is a distinctly novel one, and, if properly worked out, might result in much general benefit for the members of any society as a whole. The plan is at least worth consideration.

BOOK REVIEWS

BY C. FRANKLIN MACDONALD, D.M.D.

ANATOMY, DESCRIPTIVE AND APPLIED. By Henry Gray, F.R.S., Fellow of the Royal College of Surgeons; Lecturer on Anatomy at St. George's Hospital Medical School, London. New (English) edition, thoroughly revised and re-edited, with the Basle Anatomical Nomenclature in English, by Robert Howden, M.A., M.B., C.M., Professor of Anatomy in the University of Durham, England. Imperial octavo, 1,407 pages, with 1,126 large and elaborate engravings. Cloth, \$6, net; leather, \$7, net. Lea & Febiger, Publishers, Philadelphia and New York, 1913.

ANATOMY, DESCRIPTIVE AND APPLIED. By Henry Gray, F.R.S., Fellow of the Royal College of Surgeons; Lecturer on Anatomy at St. George's Hospital Medical School, London. New (American) edition, thoroughly revised and re-edited, with the ordinary terminology followed by the Basle Anatomical Nomenclature, by Edward Anthony Spitzka, M.D., Director of the Daniel Baugh Institute of Anatomy and Professor of General Anatomy in the Jefferson Medical College of Philadelphia. Imperial octavo, 1,502 pages, with 1,225 large and elaborate engravings. Cloth, \$6, net; leather, \$7, net. Lea & Febiger, Publishers, Philadelphia and New York, 1913.

Once more the familiar Gray's Anatomy has been given a new edition both of the American and English work. All students of anatomy for the last half century have probably utilized this text-book, either for study or for reference, and to mention Gray's Anatomy is to recall one of the most widely known books on this subject.

These present editions continue to carry on the good work of Henry Gray, and this should be quite a sufficient recommendation for them. Dr. Spitzka, of Philadelphia, has carefully revised and brought up-to-date the American edition, while Dr. Howden has been responsible for the English edition.

The Basle Anatomical Nomenclature, an attempt to unify and present terms founded upon scientific foundation, has been incorporated into these editions. In the American edition these terms are rather subordinated, the old familiar names being followed by the Latin terminology in parentheses. It is hard to eradicate the usages of a century or more, but in the course of time this new nomenclature should gradually assume the premier place which it deserves.

The methods of presenting the subject matter, the colored plates and diagrams, etc., have not been materially changed, except that some new and better illustrations have been added or substituted.

The few changes in anatomical knowledge which have occurred since the last edition have been cared for, but in the main this Gray's Anatomy still maintains its own characteristics, which make it so valuable as a text-book and a book of reference.

EXODONTIA: A Practical Treatise on the Technic of Extraction of Teeth, with a Chapter on Anesthesia. By George B. Winter, D.D.S., Professor of Exodontia and Lecturer on Anesthesia, St. Louis University School of Dentistry. Publishers: American Medical Company, St. Louis, Mo., U. S. A., Price, \$4.

Exodontia—the extraction of teeth—adds a relatively new term to dental nomenclature and one worthy of continued use. The medical dictionaries will undoubtedly incorporate it into their new editions.

The extraction of teeth has generally been accorded a comparatively limited space in the various books on Operative Dentistry, and never before been deemed worthy of being considered alone, and in such detail as the present book attempts. After a careful reading of these 400 pages one must be impressed with the fact that exodontia embraces a really extensive study. Dr. Winter has appreciated this and ought to be thanked for his efforts.

In general, minuteness of detail in explanation is the most

striking characteristic of this work, and the author seems to have considered every possible phase of the subject.

Dr. Winter begins by careful descriptions of the instruments for extraction, forceps, elevators, chisels, mouth gags, retractors, etc., and combined with the descriptions are some very excellent illustrations. Some modified elevators have been made by the author, and from the explanations given, they seem to be helpful additions.

In comparison with the usual detail which other portions of the book contain, Chapter IV upon Anatomical Landmarks, which takes up the regional anatomy of the mouth, seems very meagre, and confines itself to the dento-osseous structures, with nothing upon the blood and nerve supplies of this region.

The rather elusive subject of indications and counter-indications for extraction is covered very well and sensibly.

Examination of the mouth and teeth preliminary to extraction is dwelt upon and advisedly so; since, as the author states, "a superficial inspection of parts, with a hasty diagnosis, is liable to prove disastrous."

In positions for patient and operator when extracting, the author recommends for the inferior teeth, except under certain unusual conditions, that the operator stand above and behind the patient, rather than to right side and in front of patient. His reasons for this position may not appear sufficiently important to many adherents of the other way.

Following the general consideration of extraction, each tooth is taken up in detail; kind of forceps, application, direction of movement, etc. Displacement, involvement by caries, split root, fracture, etc., are likewise taken up in detail for each tooth, and the explanations are augmented by good illustration, all of which are original.

The chapters upon impacted third molars are quite complete and sufficiently elaborate. The radiograph as a means of diagnosis is urged as not only making a positive diagnosis, but in greatly assisting the operator to select the quickest and least complicated method of procedure. Removal of surrounding osseous structures by burrs before attempting application

of forceps, and also the use of elevators is considered in detail.

Accidents—as fracture of alveolar process, forcing tooth into cavities, disturbing of adjacent teeth, etc., have all been thought of and described.

Chapter XV deals with treatment after extraction, and is a valuable addition since post-operative care is almost always omitted from treatises upon extractions, or surgery, and this care sometimes proves to be most necessary and important.

The book closes with a chapter upon anesthesia, which is most general in outline since the author feels his work is upon the extraction of teeth, and that for anesthesia, special works should be consulted.

Dr. Winter is to be congratulated and thanked for this elaborate treatise, which shows much careful and considerate thought. It is well written, and has most splendid illustrations, which in a work of this kind are so valuable.

For any one wishing information upon the subject of exodontia this work should prove most adequate and as a student's text-book, it seems excellent.

OBITUARY

MEMORIAL TO HENRY A. SMITH, A.M., D.D.S.

Henry A. Smith, an associate member of the American Academy of Dental Science, died at his home in Cincinnati, Ohio, September 10, 1913, at the ripe age of eighty-two years.

Born in Oxford, Ohio, February 28, 1832, he early manifested a disposition for the study of dentistry, and for more than fifty years he was one of the best known men in his chosen calling.

Dr. Smith received the dental degree from the Ohio College of Dental Surgery in 1857, and the A.M. degree from the Miami University at Oxford in 1894.

For more than thirty years Dr. Smith served as Dean of the Ohio College of Dental Surgery, and during this time be-

came one of the leading authorities in his profession in the Middle West.

No man connected with the dental profession has done more to advance research work in dental surgery. His efforts were crowned with distinction throughout the United States.

Not only did Dr. Smith devote the best years of his life to the imparting of his great skill and learning to others, but he was one of Cincinnati's leading practitioners during most of his fifty years of professional life.

Dr. Smith became an Associate Fellow of the Academy in 1892, and it is fitting that this body should place upon its records its tribute to an eminent man; be it therefore,

Resolved, That in the death of Dr. Smith the dental world has lost one of its most prominent, valued, and respected members; and the Academy, an esteemed Associate Fellow, whose memory is forever engraved upon our records—a genial, whole-souled member.

Resolved, That a page be reserved for these minutes to be spread upon its records, and a copy be transmitted to the family of Dr. Smith.

MURDOCH C. SMITH,
WALDO E. BOARDMAN,
HARRY E. CUTTER,

Committee.

MEMORIAL TO THOMAS W. CLEMENTS, D.D.S., D.M.D.

The committee appointed to take action on the death of Dr. T. W. Clements begs to recommend that the Academy set aside a page of its records, In Memoriam; and that on the page be written the following:

In memory of our late Fellow, Thomas W. Clements, D.D.S., D.M.D.

He was a faithful soldier of the Republic, a good citizen, a true friend.

He exemplified to an extraordinary degree all those qualities which in their sum make the gentleman.

We mourn his loss, who brought to our profession the richest gifts of mind and heart.

As ethical Practitioner, Teacher, College Trustee, Member and Officer in Dental Societies, he did much for the advancement of Dentistry.

We sympathize with his many friends in their loss; we rejoice that it was our privilege to call him our friend, and we are glad that such a high character and delightful personality came into the profession of Dentistry.

H. A. BAKER,

F. S. BELYEA,

A. R. BROWN.

Committee.

NOTICES

INTERNATIONAL DENTAL CONGRESS, LONDON, 1914

It has been thought advisable to so arrange that those who wish to attend the International Dental Congress, in London, next summer, may go on the same steamer, if they desire.

The plan is to sail on a steamer leaving New York immediately after the closing of the National Dental Association meeting, which will be held in Rochester, N. Y., early in July.

Those who wish to join the party sailing at that time, will please notify me at 560 Fifth Avenue, New York City, at as early a date as possible, in order that the steamship company may know how many to provide for.

HERBERT L. WHEELER,
Transportation Committee of the National Dental Association.

SIXTH INTERNATIONAL DENTAL CONGRESS

LONDON, August 3-8, 1914.
Patron, His Majesty the King,
19, Hanover Square, London, W.

SECTION OF ORAL SURGERY AND SURGICAL PROSTHESIS.

The subjects for discussion are:

1. Surgical Prosthesis of the Jaws.
2. Late Results of Cleft Palate Operations.
3. Treatment of Dental and Dentigerous Cysts.

One morning will be devoted to each subject, the rest of the time will be devoted to papers on Subjects of Surgical interest in the mouth.

The committee of the section is desirous of obtaining the names of gentlemen willing either to discuss the subjects reported on, or to read papers of Surgical interest, no matter how short.

HAROLD P. AUBREY, Honorary Secretary,
40 Curzon Street, W.

THE PANAMA-PACIFIC DENTAL CONGRESS

The work of the Committee of Organization of the Panama-Pacific Dental Congress is rapidly assuming definite form, and the entire general plan of the Congress will shortly be announced.

The floor plans of the new Municipal Auditorium, in which the Congress will meet, will be sent to all prospective exhibitors within the next thirty days. The exhibits will be held in the main hall of the Auditorium, a room 190 feet square, affording ample space and light, and from present indications, all of this great area will be fully occupied. It is planned to make these exhibits and their accompanying clinics one of the great features of the Congress, and they will, aside from the general programme, afford a liberal education to any one interested in modern dentistry.

Space in the Auditorium has been reserved for the general sessions of the Congress, and for the meeting of its sections and also for the dental societies and fraternities which will meet in San Francisco during the Congress.

Three hundred thousand gum stickers bearing the seal and date of the Congress will shortly be placed in the hands of dental dealers throughout the country, and every dentist who receives goods or letters from them will in this way be reminded that it is time to prepare for a trip to San Francisco in August of 1915, to attend the Panama-Pacific Dental Congress and the Panama-Pacific International Exposition.

MINNEAPOLIS DISTRICT DENTAL SOCIETY

The Minneapolis District Dental Society will hold its annual meeting in the Masonic Temple, Minneapolis, Minn., January 16, 17, 1914. From the data now at hand, this meeting promises to be a gathering of many of the best men in the country.

A. A. ZIEROLD, Secretary.

902 Donaldson Building, Minneapolis.

INDEX TO VOLUME VIII

1913

March number includes pages 1 to 89

June number includes pages 93 to 193

September number includes pages 195 to 277

December number includes pages 279 to 432

[Abbreviations: disc., discussion; rev., review; edt., editorial; ed., edition.]

- ABBOTT, C. EDSON, "The Dental Nurse," 1
- Abscess, Alveolar, importance of prompt treatment (note), 261
- Abscessed teeth, after treatment of (note), 69
- Abutments, preparation of, H. T. Stewart on, 348
- Acetic acid, etc., action upon enamel, dentin, bone and apatite powders, Lothrop and Gies, 295
- Acidity of fruit juices, in standard terms, Lothrop and Gies, 293
- Acid-producing bacteria, influence of in precipitation of salivary mucin, Lothrop and Gies on, 287
- Acids, organic, as salivary stimulants, H. P. Pickerill on, 226
- After treatment of abscessed teeth (note), 69
- Amalgam, condensation of (note), 263
Fillings, drilling of (note), 261
With cement, mixture of (note), 258
Condensation of (note), 405
- American Society of Orthodontists (notice), 194
- Analgesia technique, precautions in (note), 68
- Anatomical dentures, some essential facts pertaining to construction of, J. H. Prothero on, 210
- "Anatomy, Descriptive and Applied," by Henry Gray, F.R.S., new English and American eds., rev., 419
- Appointments, Dental, by the Department of Health, edt., 64
- Appropriation, New York City, dental clinics, new, 84
- Ash, C. F., on removable bridge work, 382, 385
"At Last—A National Association," edt., 252
- BACTERIA, VINCENT'S, oral infection by, H. S. Vaughan, 11
- BASE plates, construction of, J. H. Prothero on, 216
- Bellevue Hospital, dental interne, 85
- Bite, taking of, J. H. Prothero on, 217
- Board of Publication, JOURNAL, 4
- Bodine, John A., on trifacial neuralgia, 46
- Book Reviews, 72, 182, 273, 419
- Boston and Tufts Dental Alumni Association meetings, 59, 60, 173, 250, 398
- Bow clasp, double, F. E. Roach on (abstract), 411
- Brannan, John W., Oral Hygiene, disc., 158
- Bridge abutments, warnings in regard to (note) 406
- CARBORUNDUM POWDER, mixture of, for grinding occlusal surfaces in the mouth, L. M. Waugh on, 243
- Carney, Matthew F., Supervisor new dental clinics, N. Y. C., 84
- Carr, William, "Early History of New York State and District Dental Societies, 28
- Cement with amalgam, the use of, Frank J. Ryan, on, 179
- Chayes, Herman E. S., on mouth conditions as related to pyorrhea, disc., 170
on removable bridge work, 386, 392

- Chemistry for Dental Students, Being
Lecture Notes on Chemistry for
Dental Students, rev., 74
- Chew, Dr. Edwin, Obituary, 87
- Christensen-Snow occluding frame, J. H.
Prothero on, 211
- Clapp, G. W., on anatomical dentures,
244
- Cleaning glass (note), 405
- Cleansing root canal broaches (note), 70
- Clinics, dental, new, appropriation, N.
Y. C., Supervisor M. F. Carney,
84
- Cocain-Adrenalin, uses of, 67
- Code of Honor, A., ed., 400
- Conference, JOURNAL, 3
- Cooke, William P., "Concerning Dental
Legislation," 36
"The Dental Nurse Problem," 341
- Correspondence: The "Fishline Method"
of wedging teeth, S. E. Davenport on, 264
- Cronin, John J., Oral Hygiene, disc.,
160
- Crown and bridge work, practical methods
of teaching same, J. F. Hovestadt on, 357
- Crown, requirements of (note), 408
- Current News, 79, 187, 267, 413
- Cuspid teeth, importance of correct occlusion of, 246
- DAVENPORT, S. E., "The Fishline Method
of Wedging Teeth," 264
- Dawbarn, R. H. M., on oral infection
by Vincent's Bacteria, 57
on trifacial neuralgia, 49
- Dental Appointments by the Department
of Health, ed., 64
- Caries, A Further Study of, A. P.
Lothrop and W. J. Gies, on, 283
- Legislation, W. P. Cooke, on, 36
- Nurse Bill, text of, 79
- Nurse Question, The, ed., 62
- Societies, N. Y. State and District, Early History of, W. Carr
on, 28
Society, Massachusetts (notice),
89
association insurance, 417
- Laws Condensed, by Alphonso
Irwin, rev., 185
- Nurse Problem, The, W. P. Cooke
on, 341
- Society of the State of New
York, Meeting of, 93
- Dentifrices, Howard C. Kelly, on, 144
- Dentition, retarded, 269
- Dentures, anatomical, some essential
facts pertaining to construction
of, J. H. Prothero on, 210
- Dies, Melotte's metal, 69
- Diagnosis, Roentgen, caution required
in (note), 259
- Discussion on "Oral Infection by Vincent's
Bacteria and its Importance to the Dental
Practitioner," 56
on "Trifacial Neuralgia: Symptomatology
and Clinical Treatment," 46
on "Oral Hygiene in Public Health
Department and Public Clinics," 158
"Some Observations on Mouth Conditions
and Retention as Related to Pyorrhea
Alveolaris from the Standpoint of the
General Practitioner of Dentistry,"
161
on "A Further Study of Dental
Caries," 363, 374
on "Relation of Riggs' Disease
and Removable Bridge Work,"
378, 396
- Dispensary Committee, Mass. Dental
Society, report for 1912-13, 230
- Drying Root-canals (note), 180
- Dunning, William B., "Professional
Journalism," 140
- EAMES, G. F., on mouth conditions as
related to pyorrhea, disc., 169
- Early History of New York State and
District Dental Societies, W.
Carr on, 28
- Enamel, quality of, Is it affected by
absorption of anything from
saliva? Lothrop and Gies, 306;
Head, 307
- "Exodontia," by G. B. Winters, D.D.S.,
rev., 420
- Extraction, hemorrhage following, 68
- Evans, George, on mouth conditions as
related to pyorrhea, disc., 161
- Evans Museum and Dental Inst., 187
- FACE BOW, use of, J. H. Prothero on,
218
- FARRAR, Dr. J. N., his life and work,
James Truman on, 198

- First District Dental Society, S. N. Y., December meeting, 46, 158, 161, 237, 363, 378
- First District Dental Society, S. N. Y., announcement of Sections for current year, 413
- "Fishline Method" (the) of wedging teeth, S. E. Davenport on, 264
- Flask, packing of, J. H. Prothero on, 223
- Flynn, Michael W., "President's Address," 136
- Fones, A. C., proposed course of instruction for dental hygienists, 415
- Force, estimation of in closing flasks, J. H. Prothero on, 224
- Formaldehyde preparations contra-indicated in septic root canals, C. J. Grove on (abstract), 410
as a cure for pyorrhea, G. A. Barnett on (abstract), 411
- Forsyth Dental Infirmary, personnel of, 267
- Fourth International Congress on School Hygiene, The, Aug. 25-30, 187
- Fourth International Congress on School Hygiene, ed., 174
- Fruit juices, acidity of in standard terms, Lothrop and Gies, 293
- GIES, W. J., and LOTHROP, "A Further Study of Dental Caries," 283: disc., 363, 374
- Gilmore, Steele F., "A Method of Retention," 118
- Gingivitis, Interstitial, and Pyorrhea Alveolaris, E. S. Talbot, rev., 273
- Gold and Tin Foils, 67
- Gold inlays, etching, to obtain better cement adhesion, R. I. Lewis, on, 180
mesh in castings for bridge attachments (note), 407
- Grievies, Clarence J., "Some Observations on Mouth Conditions and Retention as Related to Pyorrhea Alveolaris from the Standpoint of the General Practitioner of Dentistry," 96, disc., 164, 171
- Gritman-Snow occluding frame, J. H. Prothero on, 214
- Gutta-percha points—to make them more rigid (note), 405
- Gysi, the, simplex occluding frame, J. H. Prothero on, 212
- Gysi, system of registering condyle path, J. H. Prothero on, 211
- HEALTH DEPARTMENT, Dental Appointments by, 64
- Hemorrhage following extraction, 68
- Hillyer, E., on anatomical dentures, 243
- Hints for avoidance of sepsis of dental origin (note), 71
- History, Early N. Y. State and District Dental Societies, W. Carr on, 28
- Hovestadt, J. F., "Practical Methods of Teaching Crown and Bridge Work—as Adapted by the Harvard Dental School," 357
- Howe, W. A., Oral Hygiene, disc., 158
- Hutchinson, Dr., on mouth conditions as related to pyorrhea, disc., 164, 169
- Hyatt, T. P., "The Buffalo Convention on School Hygiene," 279
on removable bridge work, 392
- INFECTION, ORAL, etc., H. S. Vaughan on, 11
- Influence of the tongue on respiration (note), 69
- Insurance company's pamphlet on dental hygiene, 269
- "Intermittent Force"—J. N. Farrar originates theory of, 203
- International (Sixth) Dental Congress, London, 1914 (notice), 425
- Interne, dental, current news, 85
- Introduction (An) to Dental Anatomy and Physiology, Descriptive and Applied, rev., 76
- KAUFFER, H. J., on trifacial neuralgia, 51
- Kelley, Henry A., "Preventive Dentistry," 123
- Kelly, Howard C., "Some Facts—Chemical and Otherwise—About Dentifrices," 144
- Kingsley, Norman William, memorial to, 275
- Knowledge and Belief, H. P. Pickerill, 226
- LANOLIN for the hands (note), 406
- Lederer, Wm. J., on oral infection by Vincent's Bacteria, 56, 58
- Legislation, Dental, W. P. Cooke on, 36

- Lewis, R. I., "Etching Gold Inlays to Obtain Better Cement Adhesion," 180
- Litch, Wilbur F., obituary, 191
- Linton, C. C., report of findings on extracted teeth treated with food-acid washes, 365, 376
- Lothrop, A. P., and Gies, "A Further Study of Dental Caries," 283; disc., 363
- MACDONALD, C. F., Jr., on food-acid mouth washes, 367
- Massachusetts Dental Society (notices), 89, 193
- Massachusetts Dental Hygiene Council, Oral Hygiene, outline for lecture on, 154
- Massachusetts Dental Society, President's Address, 136
- Maxillary Osteomyelitis (note), 70
- Melotte's metal dies, 69
- Merritt, A. H., report of findings on extracted teeth treated with food-acid washes, 363, 377 on pyorrhea, etc., 379
- Minneapolis District Dental Society (notice), 426
- Modeling Compound, accurate impressions made in, 249
- Moffitt, J. J., "Radiographs in Canal Work," 180
- Mouth Conditions, as Related to Pyorrhea Alveolaris, Clarence J. Grieves, on, 96
- Moxham, H. C., "Wax Inlays" (note), 180
- Mucin, salivary, precipitation of, influence of acid producing bacteria upon, 287
- Mucin, salivary, precipitation of, by food-acid media, Lothrop and Gies on, 291
- NATIONAL DENTAL ASSOCIATION (THE), meeting at Kansas City, 195
- N. D. A. Meeting at Kansas City, The, ed., 176
- New College Building, A. ed., 177
- New Jersey State Dental Society (notice), 192
- New Jersey State Dental Society, officers for 1913-14, 277
- Nodine, Dr., on oral infection by Vincent's Bacteria, 56
- Notes on Practice, W. D. Tracy, 67, 179, 258, 405
- Notices, 88, 89, 192, 193, 277, 425, 426
- OBITUARY, DR. EDWIN CHEW, 87; Thomas W. Clements, 423; N. W. Kingsley, 275; Wilbur F. Litch, 191; Henry A. Smith, 422
- Oral and Other Aspects of Syphilis, C. M. Smith on, 19
- Oral Hygiene, outline for lecture on, 154
- Oral hygiene movement, the practical aspect of, S. J. Rauh on, 329
- Oral infection by Vincent's Bacteria, etc., H. S. Vaughan on, 11
- Oral Surgery, a text-book on, by Stewart Leroy McCurdy, rev., 182
- Osteomyelitis, maxillary (note), 70
- PAINTER, DR. CHARLES F., Dean Tufts Medical and Dental Schools, 189
- Panama-Pacific Dental Congress, The (notice), 88, 426
- Pease, J. G., on food-acid mouth washes, 370
- "Pendulum (The) in the Taggart Case," ed., 253
- Pickerill, H. P., "Knowledge and Belief," 226
- Pickerill, H. P., letter from, 190
- Plaster, physical properties of, J. H. Prothero on, 223
- Platinum collars in crowns, advantages of (note), 405
- Posts, removing same (note), 260
- Porcelain, on baking same (note), 259
- Porosity in vulcanite, prevention of (note), 406
- Potter, Wm. H., "Sterilization of the Right Angle Hand-piece" (note), 181
- Practice, Notes on, 67, 179, 258, 405
- Practice of Dentistry, The, by L. and M. Greenbaum, rev., 183
- President's Address, Michael W. Flynn, 136
- Preservatives of vinegar and fruit-acids, Lothrop and Gies, 321
- Preventive Dentistry, Henry A. Kelley, on, 123
- Professional Advice (note), 179
- Professional journalism, William B. Dunning, on, 140
- Prothero, James Harrison: "Some Essential Facts Pertaining to the Construction of Anatomical Dentures," 210, disc., 247

- Pulp removal, complete, importance of (note), 262
hemorrhage following (note), 262
Pyorrhea, Treatment of Teeth, F. H. Skinner, on, 180
- RADIOGRAPHS IN CANAL WORK, J. J. Moffitt, on, 180
- Rauh, S. J., "The Practical Aspect of the Oral Hygiene Movement," 329
- Relief Fund (The), of the National Dental Association, ed., 403
Relief fund, National Dental Association, appeal for, 414
- Reports of Society Meetings, 46, 59, 60, 158, 161, 173, 237, 250, 363, 378, 398
- RESPIRATION, influence of the tongue on (note), 69
- Retention, A Method of, Steele F. Gilmore, on, 118
- Reversal of the Taggart Decision, ed., 66
- Rhein, M. L., on removable bridge work, 393
on mouth conditions as related to pyorrhea, disc., 167, 169
- Rigg's disease and removable bridge work, H. T. Stewart on, 345, 378
- Roots, preparation of for abutments, H. T. Stewart on, 348
- Root excision, partial (note), 260
- Root canal broaches, cleansing (note), 70
Filling (note), 70
- Ryan, Frank J., "The Use of Cement with Amalgam" (note), 179
- SCHAMBERG, M. L., on trifacial neuralgia, 53
- School dispensaries, report on, by Dispensary Com., Mass. Dental Society, 230
- School Hygiene, Buffalo convention on, 279
- Secretions, internal, influence of on condition of the teeth, some suggestions on, Lothrop and Gies, 323
- Sepsis of dental origin, hints for avoidance of, 71
- Significance of Pus in the Maxillary Sinus (note), 179
- Shields, N. T., on alkalinity of saliva, 366
"Trifacial Neuralgia," etc., 5; disc., 55
- Shields, on removable bridge work, 390
- Silver nitrate stains, removal of (note), 261
- Skinner, F. H., "Treatment of Teeth Having Pyorrhea (note), 180
- Smith, C. Morton, "Oral and Other Aspects of Syphilis," 19
- Smith, K. C., on food-acid mouth washes, 365
- Speeches, First District Banquet, Notes from, 81
- Specialists in dentistry, J. N. Farrar on, 207
- Specialist, The (note), 179
- Sprue former too large (note), 258
- Stillman, P. R., on pyorrhea and removable bridge work, 385
- Sterilization of the Right Angle Hand-piece, Wm. H. Potter, on, 181
- Stewart, H. T., "Relation of Rigg's Disease and Removable Bridge Work," 345; disc., 378, 396
- Syphilis, Oral and Other Aspects of, C. M. Smith on, 19
- TAGGART DECISION, Reversal of the, ed., 66
- TAGGART-MOLL case, decision in, 271
- Text-Book of Dental Pathology and Therapeutics, A. rev., 72
- Tongue on respiration, influence of the, 69
- Toothbrushing, importance of (note), 261
- Trifacial Neuralgia, N. T. Shields on, 5
- Truman, James; "John Nutting Farrar, M.D., D.D.S., His Life and Work," 198
- Tubercular infection from dental abscess (note), 258
- Tufts College Dental School, concerning new dental dean, 86
- VAUGHAN, HAROLD S., "Oral Infection by Vincent's Bacteria, etc.," 11
- Virginia State Dental Association (notice), 192
- Vinegar, action of upon extracted teeth, Lothrop and Gies, 299, 303
- WAUGH, L. M., on anatomical dentures, 237
- Wax core, preparing the (note), 259
- Wax Inlays, H. C. Moxham, on, 180

- Welded gold bands in crown and bridge work (note), 407
- Wheeler, Herbert L., Meeting of the Dental Society of the State of New York, 93
- Wheeler, Herbert, L., "The N. D. A. Meeting at Kansas City," 195
- Zentler, Dr., on food-acid mouth washes, 371

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